# The Mining Journal

## RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

No. 644.—Vol. XVII. LONDON, SATURDAY, DECEMBER 25, 1847. [Price 6d.


GREENWICH HOSPITAL.

**SALE OF LEAD ORE AT ALSTON MOOR.**—The following PARCELS of LEAD ORE—viz.:—

| | Computed Weight. |
|---|---|
| At Nent Head Receiving House—No. 1 | 424 bings. |
| " " 2 | 194 " |
| At Hudgill Burn Receiving House | 200 " |
| At Low Byer Receiving House—No. 1 | 116 " |
| " " 2 | 92 " |
| " " 3 | 193 " |
| Total | 1219 " |

Samples of the ores will be forwarded to any parties wishing to purchase, who may not appoint agents to examine them, on application to Mr. Paull, Alston, Cumberland.

Tenders for the purchase of the above parcels of ore, separately, will be received by Mr. Grey, at the Low Byer Inn, Alston, up to Twelve o'clock on Thursday, the 13th day of January, 1848; and conditions of sale may be had on application to Mr. Grey, at the Greenwich Hospital Office, Dilston, Newcastle-on-Tyne.

**VALUABLE PUMPING AND WINDING ENGINES FOR SALE.**—TO BE SOLD, BY PRIVATE CONTRACT, at WHEAL VOR MINE, in the parish of BREAGE, CORNWALL—

1 80-inch DRAUGHT ENGINE, 10-feet stroke in cylinder, and 8 feet in shaft, main beam and caps, top nozzle, spring piston and rod—all new this year; with four boilers, of 11 tons each, in excellent repair.
1 80-inch DITTO, 10 feet stroke in cylinder, 7½ feet in shaft, cylinder, piston, bottom and cover, nearly new, with two boilers, of 12 tons each, and three boilers, of 10 tons each, all lately thoroughly repaired.
1 49-inch DITTO, 9 feet stroke in cylinder, and 7 feet in shaft, without boilers.
1 20-inch WINDING ENGINE, 5 feet stroke, with two boilers, of 4 and 6 tons, and vertical cage, all in complete repair—the boilers and some other parts nearly new.
1 18-inch DITTO, 4 ft. stroke, with one boiler, of 5 tons, and horizontal cage, complete.
Several TONS of straight and turned STEAM-PIPES.
3 12-head CAST-IRON STAMPS AXLES, with bearings, oak frames, &c., complete.
A powerful WEIGHING MACHINE, nearly new, comprising every requisite.
An immense number of PUMPS, matching-pieces and windbores, 12 to 17-inch bore, with working barrels, doorpieces, H-pieces, cases, with stuffing-boxes and glands to match, from 11 to 19 inches bore, and plunger-poles, from 12 to 19 diameter.
Faggotted rod and cap plates, 6, 7, and 8 inches wide, staples and glands, eyerunners, caps, saddles, troughs and gudgeons for balance and other bobs.

Application to be made to Capt. R. Blight, jun., on the mine.

Dated Nov. 29, 1847.

N.B.—The above are of easy transit to Hayle wharfs, and from thence on ship-board, if required.

**LAXEY MINES, ISLE OF MAN.—TO BE SOLD, BY** PUBLIC AUCTION, by order of the Court of Chancery, at the instance of the Receiver of the Assets of the Isle of Man Joint-Stock Banking Company, on Tuesday, the 31st of January, 1848, at Twelve o'clock noon, in the Wellington Hall, Douglas, THREE SHARES, and FOUR-SEVENTHS of a SHARE, in the LAXEY MINES, carried on in the parish of Lonan, in this island.

These mines, which are held under lease from the Government, including the whole parish of Lonan, are well known to produce the richest ore in this island—the property in which is divided into 20 shares.

A large sum of money has been expended in improvements, and in the erection of new and substantial machinery, which are nearly completed, and by which the mine will be placed in a most efficient working state—superior, in every respect, to what it has ever previously been in. The average raisings of ore for the last 12 months have been 50 tons of lead, and 300 tons of black-jack, per month, which is, at least, one-third more than has been raised within any 12 months previous. The stock in hand is valued at upwards of £4000, to a proportionate share whereof the purchasers of the above shares will be entitled.—The mine can be seen upon application to Capt. Rowe, the manager at the mines, who will give such information as may be required; and further particulars may be had from the Receiver. SENHOUSE WILSON, Advocate, Douglas.

Isle of Man, Dec. 22, 1847.

**AYRSHIRE.—TO BE LET, the COAL, IRONSTONE, and** FIRE-CLAY, in the ESTATE of WATERHEAD, lying in the parish of NEW CUMNOCK, the property of Sir John Cathcart, Bart. This estate is in the vicinity of the Mithsdale Iron-Works, now being erected, on the one side, and of the Dalmellington Iron-Works, on the other; and it is believed the BLACK-BAND IRONSTONE, which is found in the estates of the Marquis of Bute, Craigangillan and Afton, adjoining, passes under about 1500 acres of Waterhead lands. There are also CLAY-BAND IRONSTONE and LIMESTONE in the property, and SMITHY COAL is now working within it. The Glasgow and Carlisle Railway, now in course of being made, passes within 3 miles of the lands. There are various FIELDS of MINERALS in ESTATES adjoining, and in the near neighbourhood, now TO BE LET, so that any company, of skill and capital, would have ample scope for establishing iron-works on a large scale.

A plan of the estate, and general section of the minerals, with samples of the ironstone, will be seen on application to John Geddes, Esq., mining engineer, No. 49, Albany-street, Edinburgh; Arthur Campbell, W.S., No. 32, Dublin-street, Edinburgh; or Mr. Kennedy Brown, writer, Girvan—either of whom will receive offers for a lease.

Wm. Gemmell, residing at Meikleshill, on the estate, will point out the boundaries of it.

**BLEWITT'S REFINED IRON, OR METAL.**—(For a description of the process, and the claim of the patentee, see the *Mining Journal* of December 11, 1847).

ADVANTAGES.

Improved quality—less waste of metal—less expense of fuel. Improved quality evidenced by the high character of the iron in the market, for combined strength and ductility.

SAVING OF IRON.

| | cwts. | qrs. |
|---|---|---|
| By the old refinery, the average annual yield of pig-iron to a ton of metal, at most of the works in Wales, is not less than | 22 | 0 |
| By the new patent process, the average yield does not exceed | 21 | 1 |
| Saving | 1 | 3 |

| | |
|---|---|
| In the refinery, the yield of coal made into coke is about | 15 cwts. |
| By the new process, the yield of coal (which is used without being coked) is about | 9 " |
| Saving | 6 " |

| | |
|---|---|
| The saving of 1 cwt. 3 qrs. of pig-iron, at £4 per ton, will be | 7s 0d |
| The saving of 6 cwts. of coal, at 4s. per ton—say | 1 2 |
| Total saving, per ton of metal | 8s 2d |

The yield of the metal, in puddling, does not exceed 21 cwts. to the ton, and is, on the average, much less.

Samples of the metal may be had, and terms of licenses for the use of the patent process, may be known on application to R. J. Blewitt, Esq., M.P., Llantarnam Abbey, near Newport, Monmouthshire.

**CWMBRAIN BAR-IRON AND BOILER-PLATE WORKS,** NEWPORT, MONMOUTHSHIRE.

Best BAR-IRON, RAILS, BOILER-PLATES, SHEETS, &c., MANUFACTURED at the ABOVE WORKS, from BLEWITT'S PATENT METAL, and warranted equal, if not superior, to Staffordshire or Shropshire iron.

**STRONG MIXING PIG-IRON.**—The YSTALYFERA IRON COMPANY beg to solicit ORDERS for their ANTHRACITE PIG-IRON. This iron mixes well with Scotch pig—imparting to it strength and elasticity, and relieving from it a portion of its softness and fluidity. No. 3 Pig is recommended for mixing with soft iron—Nos. 1 and 2, for machinery castings, requiring great soundness and strength. At this period, when cast-iron is so much employed in the construction of bridges and other buildings, requiring all the strength and elasticity which the best mixture of metal will afford, it may be interesting to call attention to the characteristics of ANTHRACITE PIG-IRON, as REPORTED on by that great practical authority, the late DAVID MUSHET, Esq., M.I.C.E.:—

"It greatly exceeds, in *strength*, in *defective* powers, and capacity to resist *impact*, any iron at this time manufactured in the United Kingdom."

"It now only remains for me to mention a property peculiar to this iron, which was noticed at the time I made the trial experiments, four years ago, but which has been more fully developed in those more recently made. The property referred to is one of *great springiness*, or *elasticity*, which communicates a tendency to the bar, in deflecting and breaking, to resume its rectangular form. Bars that had obtained a permanent set of 2-10ths, when afterwards broken, presented but a slight deviation from a right line; and in no case, did the curvature exceed one-fourth of a tenth."

"It was also remarked, that most of the fractures, in breaking, presented a *regularity of grain* throughout, resembling the structure of *unhardened steel*."

Address THE YSTALYFERA IRON COMPANY.

Dated June 23, 1847. *Near NEATH, SOUTH WALES.*

**HOT-BLAST WITHOUT COAL, LABOUR, OR REPAIRS.** DIXON AND BUDD'S PATENTS.

Apply for particulars, or to inspect the process in operation on six blast-furnaces, to J. Palmer Budd, Esq., Ystalyfera Iron-Works, near Neath.

Dated June 22, 1847.

**ADCOCK'S PATENT SPRAY PUMP.**—This important INVENTION having been PERFECTED, and brought into SUCCESSFUL PRACTICAL OPERATION at LLANHIDDEL, at pits belonging to R. J. Blewitt, Esq., M.P., Llantarnam Abbey, near Newport, Monmouthshire, the PATENTEE is ready to RECEIVE, and to execute, ORDERS.—Apply to Henry Adcock, C.E., at his offices, 137, Strand, London, where pamphlets, descriptive of the invention, may be had; at the office of the *Mining Journal*, 26, Fleet-street; and through any respectable bookseller—price 6d.

**PROPOSED LAMBETH PALACE IRON BRIDGE.** Plain and coloured, from 5s. to 7s. 6d. each.

In a few days will be published, a beautiful LITHOGRAPHIC ENGRAVING of THOMAS MOTLEY'S SPLENDID and NOVEL DESIGN for the above-mentioned BRIDGE.

May be had at the office of the *Mining Journal*, 26, Fleet-street; of Mr. Weale, Architectural Library, High Holborn; and of Charles Gilpin, Bishopsgate-street.

**TO RAILWAY ENGINEERS, CONTRACTORS, AND** OTHERS.—The ADVERTISER having obtained her Majesty's Letters Patent for an IRON TRUSS BRIDGE, peculiarly adapted, from its great strength and economy, for RAILROADS, is ready to TREAT with such companies, and other persons, as may feel disposed to adopt it. This bridge has been put up in the United States, on the New York and Harlem railroad—it being one of 70 feet span, and weighing only 13 tons; and is highly approved of by the directors—in consequence of which several other companies are giving their orders for its erection.

A model can be seen, and further particulars given, either personally or by letter, on application to Mr. S. Moulton, care of the Editor of the *Mining Journal*, 26, Fleet-street.

**CALEDONIAN RAILWAY—LOANS ON DEBENTURES.** The CALEDONIAN RAILWAY COMPANY are prepared to RECEIVE TENDERS OF LOANS ON DEBENTURES, in sums of not less than £500, for three or five years—bearing interest at the rate of 5 per cent. per annum, payable half-yearly, in Edinburgh, Glasgow, London, Liverpool, Manchester, or Bristol.

Tenders to be addressed to this office. Parties may also communicate personally with Messrs. Foster and Braithwaite, 63, Old Broad-street, London.

By order of the directors, D. RANKINE, Treasurer.

Caledonian Railway Office, 122, Princes-street, Edinburgh, March 26, 1847.

**BIRMINGHAM AND OXFORD JUNCTION RAILWAY.** TO THE DIRECTORS OF THE BIRMINGHAM AND OXFORD JUNCTION RAILWAY COMPANY.

WE, the undersigned, being shareholders in the Birmingham and Oxford Junction Railway Company, holding in the aggregate more than five thousand shares (that is to say, more than one-tenth part of the capital), therein do by this writing under our hands require you forthwith, on the receipt hereof, to call an EXTRAORDINARY GENERAL MEETING of the shareholders of the said company, for the following objects or purposes, that is to say, for the purpose of considering the subject of an action lately commenced against the said company, by Messieurs Samuel Morton Peto and William Easted, and also the several actions which have been commenced in the name of the said company against various shareholders therein, for enforcing payment of a call made, or purporting to have been made, on the twelfth day of June, one thousand eight hundred and forty-seven; and for the purpose of considering and determining upon and giving such directions as may be thought fit, as to the course to be adopted by the said company with reference to such actions respectively, and the subjects thereof respectively, and of considering the propriety of appointing, and if so thought fit of appointing, under the common seal of the said company or otherwise, and directing the employment of an attorney and solicitor, or attorneys and solicitors of the said company, to act on behalf of the said company generally and in all matters or on such particular matters, and for such period, and either exclusively or otherwise, as the said meeting shall think fit; and resolve, and also to consider the propriety of removing, and if thought proper to remove, or discontinue the employment of any person or persons who have, or has, acted as attorneys or solicitors, or as attorney or solicitor of the said company, and giving such directions, and making such orders as the said meeting may deem expedient in reference to, or consequential upon, any such appointment, employment, or removal, or other the matters aforesaid, or any of them; and also to take into consideration, and to determine whether any, and if any, what measures should be taken as to soliciting, prosecuting, supporting, or opposing any bills or bill, or other proceedings or proceeding before Parliament on the behalf, or in the name, of the said company; and as to taking, prosecuting, discontinuing, withdrawing, or abandoning, any notices or other proceedings which have been, or may be, given or taken with reference to any such bills or bill, or other proceedings in Parliament, and giving all such directions as to such meeting may seem proper in reference to any such matters.—Witness our hands, this 5th day of November, 1847.

| | |
|---|---|
| Elias J. Mozley | Aubrey Alexander Hoghton |
| T. D. Hornby | John Sanderson |
| Edward Cropper | Christopher Hird Jones |
| William Reynolds, jun. | Thomas Booth |
| Robert Bickerstath | Charles Wilson |
| William Hall | Robert Jones |
| Lewin Mozley | James Ryley |
| Thomas Arthur Hope | Hardman Earle |
| Thomas Goodier | Edward Tootal |
| Charles Mozley | Samuel Brooks |
| Josiah Jones | Absalom Watkin |
| Henry Tootal | W. John Beale |
| Samuel Beale | Abel Peyton |
| Harman Griswood | T. R. Cobb |
| John Edward Phillips | |

The requisition above set forth having been presented to the directors of the Birmingham and Oxford Junction Railway Company, Notice is hereby given, that an EXTRAORDINARY GENERAL MEETING of the shareholders of the said company will be HELD at Dee's Royal Hotel, in Birmingham, on Tuesday, the 28th day of December next, at half-past Two o'clock in the afternoon.

P. H. MUNTZ, Chairman.

JOHN W. KIRSHAW, Secretary.

34, Bennett's-hill, Birmingham, November 27, 1847.

**ELECTRIC TELEGRAPH COMPANY,** *LONDON, 345, STRAND, September 1, 1847.*

COMMERCIAL TELEGRAPH.

The works of the lines for commercial communications, between the places enumerated below, embracing a SYSTEM of TELEGRAPHS for COMMERCIAL PURPOSES only, and distinct from that reserved for the special use of railways, being so far advanced as to admit of their completion by the commencement of the coming year, the directors think that the time has now arrived, when it becomes their duty to make known the arrangements which they contemplate for the accommodation of the public.

STATIONS will BE OPENED, in central situations, in the PRINCIPAL TOWNS, whence MESSAGES and DISPATCHES will be FORWARDED TO, and RECEIVED FROM, all the OTHER STATIONS of the ELECTRIC TELEGRAPH COMPANY.

In order to give to Merchants, Bankers, Manufacturers, and all connected with trade, the greatest possible amount of information, a ROOM will be RESERVED in each of the COMPANY'S STATIONS for SUBSCRIBERS, in which will be received, tabulated, and exhibited, all Intelligence of Commercial or Public Interest—for instance:

SHIP LISTS, from the various Ports.
SHARE LISTS, from the various Exchanges.
PRICES CURRENT.
STOCK EXCHANGE LISTS.
CORN MARKETS, from the various Towns.
PRICES OF LIVE STOCK, &c. &c.

In LONDON, a CENTRAL STATION, suited to the importance of the metropolis, is in COURSE OF ERECTION, in the immediate vicinity of the Bank and Royal Exchange; in this Station the whole TELEGRAPHIC NEWS of the COUNTRY will be CONCENTRATED, and FORWARDED in EVERY DIRECTION. And here, as in other towns, a ROOM will be RESERVED for SUBSCRIBERS.

The SUBSCRIPTION to these ROOMS will be TWO GUINEAS per annum, paid in advance, which will entitle SUBSCRIBERS to the RIGHT of ENTRANCE to ALL the SUBSCRIPTION ROOMS of the COMPANY—including the Central Station at London.

The foregoing details some of the advantages of the Commercial Telegraph to subscribers; but the requirements of the public in general will be provided for by the establishment of offices, which will at all times be open for the reception and transmission of messages and dispatches; while messengers will be kept at the various stations, by whom dispatches may be sent out to any part of the town where the communication has been received by Telegraph at the Company's Station.

Subscribers' Names are received at the Commercial Telegraph Office, where any further information may be obtained.

The following are the Towns to which the Commercial Telegraph will be first extended:—

| | | | | |
|---|---|---|---|---|
| London | Chester | Southampton | Derby | Darlington |
| Margate | Liverpool | Winchester | Nottingham | Newcastle |
| Ramsgate | Rotherham | Dorchester | Lincoln | Berwick |
| Deal | Barnsley | Bristol | Chesterfield | Edinburgh |
| Dover | Wakefield | Gloucester | Sheffield | Glasgow |
| Folkestone | Leeds | Cheltenham | Bradford | Scarborough |
| Canterbury | Halifax | Peterborough | Wisbeach | Bridlington |
| Northampton | Rochdale | Yarmouth | Lowestoff | Stamford |
| Coventry | Hull | Huntingdon | Cambridge | Norwich |
| Birmingham | Maidstone | Hertford | Chelmsford | St. Ives |
| Wolverhampton | Tonbridge | Manchester | Ipswich | Ware |
| Stafford | Gosport | Leicester | York | Colchester |

J. LEWIS RICARDO, Chairman.

**RAILWAY ACCIDENTS.**—The PRACTICABILITY of our "MEANS OF COMMUNICATION BETWEEN THE GUARDS (or passengers) and ENGINE-DRIVER," as well as our ELECTRIC TELEGRAPH, and arrangements, may be seen by applying to BRETT & LITTLE, Furnival's Inn, London.

**FLEXIBLE HOSE-PIPES FOR LOCOMOTIVE ENGINES,** RAILWAY CRANES, FIRE-ENGINES, GAS, &c.
PATENT VULCANISED INDIA-RUBBER HOSE-PIPES AND TUBING OF EVERY DESCRIPTION.

These pipes are made to stand hot-water without injury—are very superior to leather pipes, or the common India-rubber pipes; and, as they do not become hard or stiff in the lowest temperatures, or require any application when out of use, are particularly well adapted for fire-engines.

FLEXIBLE TUBING, of every description, for gas, chemical purposes, &c.
VULCANISED INDIA-RUBBER WASHERS, all sizes, for steam and hot-water joints, &c.—Sole manufacturer, JAMES LYNE HANCOCK,
Goswell Mews, Goswell-road, London.

**TO PROVINCIAL FOUNDERS, &c.**—The ADVERTISERS are OPEN for an exclusive AGENCY in LONDON, to an IRON FOUNDER of respectability, who can successfully compete with other houses in the trade—in PRICE, QUALITY, and TIME—for GENERAL, MACHINE, and BUILDING CASTINGS. The advertisers having an old and well-established connection with Engineers and Contractors, Architects, Builders, and others, any house desirous of extending their business will find this an opportunity of being well represented.—Address (per letter, post-paid) to "S. E. & Co." *Mining Journal* Office, 26, Fleet-street, London.

**TO MERCHANTS AND OTHERS.**—WANTED, by the proprietor of an extensive mercantile business in London, a PARTNER, who can command about £1000 in cash, or give security for £1500. Consideration required very moderate.—For further particulars apply by letter (post-paid) to "X. Y. Z.," 14, Great College-street, Camden New Town.

**TO LEAD SMELTERS.**—WANTED, in a factory, near London, a MAN, thoroughly PRACTISED in the PROCESSES for EXTRACTING SILVER FROM LEAD ORE.—Address "F. K. A.," Post-office, Cornhill, London.

**TO BE DISPOSED OF**—A GAS APPARATUS, nearly new, suitable for LIGHTING a SMALL TOWN, RAILWAY STATION, or MANUFACTORY, consisting of a circular gasholder, 16 feet diameter by 12 feet deep; two D retorts, 6 feet long by 1 foot diameter, with stand, pipes, and hydraulic main; air condenser, made of 3-inch pipes; dry lime purifier, with all valves and connections, complete. Taken to pieces, and loaded on boat or waggon, for £150.

Apply to Messrs. A. Everitt and Son, Birmingham.

**WHEAL BARBARA AND CASCADE MINES.**—TWENTY-FIVE SHARES in the WHEAL BARBARA MINE, and TWENTY SHARES in the CASCADE MINE, TO BE SOLD FOR THIRTY-FIVE POUNDS.—Apply to Mr. Trenery, mining agent, 1, St. Michael's-alley, Cornhill.

**WANTED, for HERODSFOOT MINE, a SECOND-HAND** DOUBLE-ACTING ROTARY STEAM-ENGINE, of from 18 to 22-inch diameter in cylinder, with BOILER, complete, and with or without winding and crushing machinery. The engine must be in good condition.—Description, specifying particularly the age, the length of stroke, and weight of boiler, with terms, may be sent to Mr. Bone, purser, Liskeard.

**FOR SALE, a 70-inch cylinder ENGINE, without boilers.**—For price, and further particulars, please apply to Samuel Grose, Esq., engineer, Wall, Gwinear, Camborne.

**STEAM-ENGINES.**—From 8 to 20-horse power ENGINES ALWAYS IN STOCK.

Apply to Mr. CAPPER, Engine-Maker and Founder, BIRMINGHAM.

*Price*—£12 to £16; with boiler, £22 per horse.

**WILSON & FRASER, 2, WELLINGTON-BUILDINGS,** LIVERPOOL, and 18, EXCHANGE-PLACE, GLASGOW, have always ON SALE PIG-IRON, BAR-IRON, RAILWAY CHAIRS, and RAILWAY BARS.

**MR. R. TREDINNICK, THREE KING'S COURT,** *LOMBARD-STREET, LONDON,*

Continues to DEAL in every description of MINING, RAILWAY, BANKING, INSURANCE, CANAL, and OTHER SHARES.—Statistical information afforded gratuitously, upon personal application.—MONEY ADVANCED upon the above securities.

**JAMES LANE, MINING SHARE DEALER,** *75, OLD BROAD-STREET, LONDON.*

**BRITISH MINING OFFICES, No. 12, HAYMARKET,** And No. 41, MOORGATE-STREET, LONDON,
*And No. 4, STAMP-OFFICE BUILDINGS, MANCHESTER.*

At either of which places PROSPECTUSES and SHARES in the various SILVER-LEAD and COPPER MINES connected with these offices, may be obtained.

T. H. TAUNTON, London.
W. SHEARMAN, Manchester.

**MONEY.**—MESSRS. KILLICK & CO. (late WINSTANLEY, KILLICK, & Co.), SHAREBROKERS, inform their friends and the public, they make IMMEDIATE ADVANCES, to any amount, on the deposit of English and Foreign Railway Shares, Scrip, and Debentures, upon exceedingly advantageous terms: they also BUY and SELL every description of STOCK and MINING SHARES, at much less commission than usually charged.

6, Bank Chambers, opposite the Bank of England.

**BLAENAVON IRON AND COAL COMPANY.**—The INTEREST on the DEBENTURES in this company, payable half-yearly, may be RECEIVED on application at these offices, on and after the 5th of January next, between the hours of Eleven and Three o'clock. By order of the board,

Offices, 4, Pancras-lane, Dec. 17, 1847. JAMES BOOTH, Secretary.

**CALLINGTON MINES COMPANY.**—At a Quarterly General Meeting of the shareholders in this company, held at the offices, 44, Finsbury-square, on Wednesday, the 22d inst.,

RICHARD HODGSON, Esq., in the chair.

It was moved, seconded, and resolved unanimously, that the thanks of this meeting are due, and are hereby given, to the chairman and directors, for their constant attention and exertion for the best interests of the company.

It was moved, seconded, and carried unanimously, that the thanks of this meeting are due, and are hereby given, to Mr. Percival Johnson, for his constant attention to their interests, as the company's adviser.

It was moved, seconded, and carried unanimously, that the thanks of this meeting be awarded to Capt. Phillips, their mine agent, for his constant exertions in the full development of the mine, and for the general interests of the company.

44, Finsbury-square, Dec. 22, 1847.

**CONSOLIDATED COPPER MINES OF COBRE ASSOCIATION.**—Notice is hereby given, that a HALF-YEARLY GENERAL MEETING of the proprietors of this association will be HELD, in conformity with the Deed of Settlement, at the office of the company, 26, Austinfriars, on Monday, the 3d day of January, 1848, at One o'clock precisely. On that day two directors (namely, Sir John Pirie, Bart., and George Whitmore, Esq.), and one auditor (Alex. Druce, Esq.), will go out of office by rotation, agreeably to the Deed of Settlement, but are immediately re-eligible, and are candidates, for re-election.

It is necessary that parties intending to offer themselves as candidates for the direction and auditorship, should leave notice of such their intention with the secretary, at the office of the company, 26, Austinfriars, at least 14 clear days before the day of election.

By order of the court of directors,

26, Austinfriars, Dec. 15, 1847. WM. LECKIE, Secretary.

**ROYAL SANTIAGO MINING COMPANY.**—The directors hereby give Notice, that the HALF-YEARLY GENERAL MEETING of the shareholders will be HELD at the office of the company on Wednesday, the 5th January next, at One o'clock precisely, when the directors will make their report.

38, Broad-street-buildings, Dec. 18, 1847.

**TRELEIGH CONSOLIDATED MINING COMPANY.**—The directors hereby give Notice, that a MEETING of the shareholders will be HELD at the office on Monday, the 3d of January next, at One o'clock precisely, when the accounts for three months, ending the 31st December, will be laid before them.

37, Old Broad-street, Dec. 10, 1847. WM. NICHOLSON, Secretary.

**WHEAL CURTIS COPPER MINING COMPANY.**—Notice is hereby given, that an ORDINARY GENERAL MEETING of the shareholders of this company will TAKE PLACE at the Guildhall Coffee-house, King-street, Cheapside, London, on Wednesday, the 5th day of January, 1848, at Two o'clock precisely, to receive from the board of directors a statement of the accounts and affairs of the company, and for the election of directors, in the room of the present directors, who, in conformity with the Deed of Settlement, go out of office, but are re-eligible, and who now offer themselves as candidates, and on the affairs of the company generally. Any other shareholders intending to offer themselves as candidates for the office of directors, will have the goodness to give notice thereof, without delay, to the secretary, at the company's offices, as below. The books of the company, and the balance-sheet, may be inspected by the shareholders, at the said offices, on any day prior to the said meeting, between the hours of Eleven and Three o'clock. By order of the board,

GEO. A. JACOBS, Secretary.

Basinghall Chambers, Basinghall-street, London, Dec. 23, 1847.

**NOTICE.**—The court of directors of the ST. KATHARINE DOCK COMPANY do hereby give Notice, that a GENERAL HALF-YEARLY MEETING of the proprietors will be HELD at the Dock-house, Tower-hill, in the county of Middlesex, on Tuesday, the 18th of January next, at Twelve o'clock at noon, for the purpose of declaring a dividend on the capital stock of the company, for the half-year ending the 31st inst., when the accounts of receipt and expenditure of the said company for the year ending the 31st inst., will be laid before the proprietors; which accounts will be ready for examination, or inspection, by such proprietors on and after Tuesday, the 4th day of January next.

The books of the company will close on Thursday, the 23d inst., and open on Saturday, the 29th day of January next. By order of the court,

St. Katharine Dock-house, Dec. 14, 1847. JOHN HALL, Secretary.

N.B.—The chair will be taken at One o'clock precisely.

SIR JAMES MURRAY'S FLUID MAGNESIA.—Prepared under the immediate care of the inventor, and established for upwards of 30 years.—This elegant preparation is recommended in all cases of bile, acidities, indigestion, gout, and gravel, as the most safe, easy, and effectual form in which magnesia may—and, indeed, the only one in which it ought—to be exhibited, possessing all the properties of the magnesia now in general use, without being liable, like it, to form dangerous concretions in the bowels, it effectually cures HEARTBURN without injuring the coats of the stomach, as soda, potass, and their carbonates are known to do; it prevents the food of infants turning sour; in all cases it acts as a pleasing aperient, and is peculiarly adapted to females. It has long been known that the most serious consequences have frequently resulted from the use of solid magnesia, which has been proved by Mr. Brande and many other eminent chemists, to form concretions in the bowels, endangering, and, in some instances, destroying life.—Sir HUMPHREY DAVY testified that this solution forms soluble combinations with uric acid salts in cases of gout and gravel—thereby counteracting their injurious tendency, when other alkalies, and even magnesia itself, had failed.

From Sir PHILIP CRAMPTON, Bart., Surgeon-General to the Army in Ireland:—"DEAR SIR,—There can be no doubt that magnesia may be administered more safely in the form of a concentrated solution than in substance; for this, and many other reasons, I am of opinion that the fluid magnesia is a *very valuable* addition to our Materia Medica.—PHILIP CRAMPTON."—Sir J. Clarke, Sir A. Cooper, Dr. Bright, and Messrs. Guthrie, and Herbert Mayo, of London, strongly recommend Murray's Fluid Magnesia, as being infinitely more safe and convenient than the solid, and free from the danger attending the constant use of *soda or potash*.

Letter from J. Murray, Esq., Lecturer on Chemistry, F.S.A., P.L.S.:—

"DEAR SIR JAMES,—Many years have elapsed since you first showed me, in your laboratories, your super-carbonate, or soluble magnesia, and demonstrated experimentally the remarkable quantity of pure magnesia held in transparent solution. It was then new to me, as it was to the chemical world, and I speak advisedly, as a practical chemist. I believe its medical value cannot be too highly estimated; and I am satisfied that the public is under an infinite debt of gratitude to you for those invaluable researches, which have been the means of its introduction. Not to mention its more obvious healing virtues, I believe it to be almost, if not altogether, a specific for lithic acid concretions, when used in the pure condensed solution invented by you.

'Believe me to be your's, faithfully, JOHN MURRAY, F.S.A.

"To Sir James Murray, Dublin. Portland-place, Hull, Aug. 30, 1839."

The following testimonial of the celebrated "Distin Family," who are well known to her Majesty and the nobility of England proves the great value of Sir James Murray's fluid magnesia, and is very encouraging for delicate persons going to sea:—

"SIR,—Having arrived from Glasgow, per the steam-ship *Jupiter*, in this stormy season, without the slightest sea sickness, we feel bound to attribute this exemption to the most agreeable *effervescent draught* of your solution of magnesia and acidulated syrup, which were kindly furnished to us by that attentive officer, Capt. Ellis. Upon all former occasions we were martyrs to sea sickness, and we think it a great blessing that travellers may now enjoy such health and comfort at sea, as we derived from the use of this *delightful drink*.

"THE DISTIN FAMILY.

"To Sir J. Murray. Tuthill's Hotel, Dawson-street, Dublin, Feb. 19, 1839."

From Dr. KENNEDY, Master of the Lying-in Hospital, Dublin:—

"DEAR SIR,—I consider the fluid magnesia to be a *very valuable* and *convenient* remedy in cases of irritation or acidity of the stomach, but more particularly during pregnancy, febrile complaints, infantile diseases, or sea sickness."

In addition to the above, Professor Duncan, of Edinburgh, in his extensive practice, established its efficacy for removing acidities—allaying irritation of the stomach or urinary organs, and for dissolving lithic concretions and uric salts; and, consequently, as the best remedy for gravel and gout.

CAUTION.—In order to avoid the danger of concretions and sediments, which result from the use of over-saturated and unchemical compounds, made by non-medical persons, the public will please to observe, that Sir James Murray's pure fluid magnesia is prepared of that proportion of strength which is conformable to the laws of chemical equivalents, and which has been proved, in hospital and private practice, during the last 30 years, to be the best adapted for the human stomach, and the most suitable for the treatment of females and children.

Sold by the sole consignee, Mr. WILLIAM BAILEY, of North-street, Wolverhampton, and all wholesale and retail druggists and medicine agents throughout the British empire, in bottles, 1s., 2s. 6d., 3s. 6d., 5s. 6d., 11s., and 21s. each. The acidulated syrup, in bottles, 2s. each.—N.B. Be sure to ask for "Sir James Murray's Preparation," and to see that his name is stamped on each label, in *green ink*, as follows:—"James Murray, Physician to the Lord Lieutenant."

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PART THE FIRST treats of the anatomy and physiology of the reproductive organs, and is illustrated by six coloured engravings.—PART THE SECOND treats of the consequences resulting from excessive indulgence, and their lamentable effects on the system, producing mental and bodily weakness, nervous excitement, and generative incapacity; it is illustrated by three explanatory engravings.—PART THE THIRD treats of the diseases resulting from infection, either in the primary or secondary form, and contains explicit directions for their treatment. The consequences of neglect, and of the abuse, of mercury are also clearly pointed out. This section is illustrated by 17 coloured engravings.—PART THE FOURTH treats of Perry's Preventative Lotion, by the use of which the dangers of infection are obviated. Its action is simple but sure; it combines with the virus chemically, and destroys its power on the system.—PART THE FIFTH is devoted to the consideration of marriage and its duties. The causes of unproductive unions are also considered, and the whole subject critically and philosophically inquired into.

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## RAILWAY LEGISLATION—NEW RAILWAYS BILL.

The Railways Bill has been passed to the House of Lords, somewhat improved in its details, but in substance as we described it on its first appearance in Parliament. The benefit to be expected from it may, perhaps, consist as much in allaying certain anxieties, as in the direct use to be made of its provisions; in the meanwhile, it is well that Ministers have avoided the error of making it a coercive instrument, as some of their reckless advisers would have had them do. This part of the subject being now disposed of in the Commons, we may return to our survey of the more general scheme of regulation, suspended last summer, but which, if reports may be trusted, is to be revived, with certain alterations, in the present session.

We have already spoken of the objects included in that measure, that were at once the most important in their nature, and the fittest for administrative control. The exercise of a proper superintendence by the State over the general scheme and direction of great national works, clearly belongs to its province; and any questions that can be raised on this subject belong, as we have seen, firstly to the singularity of attending to it at the twelfth hour, when the main part of the work has already been done, without any guidance from authority whatever; and, secondly, to the description of persons to whom its direction may be entrusted hereafter—it being obvious, that whatever may yet remain, subject to control, had far better be left to such chance determination, as has hitherto prevailed, than be put into incompetent hands, or into hands bat, however well qualified to act, are tied up from acting efficiently. The main outlines of the railway system, it has been observed, are now drawn beyond recall, as accident has determined; but if it be now thought necessary to take a stricter course with the mere remnants and fillings-up of the general scheme, there can be no doubt that it will be quite in accordance with the natural office of a Government to regulate these—the only proviso being, that the business shall be thoroughly transacted by men, who know what they are doing, and who are resolved to do it justly.

On the other principal class of objects intended by Mr. Strutt's late bill, a very different opinion may be entertained. The design of undertaking a so-called superintendence of working railways, in the manner proposed, cannot well be reconciled with any understanding that has hitherto prevailed in this country, as to the duties of the governing body, and is open to objection, not on this account only, but because the questionable nature and harrassing effects of the plan would not be redeemed by any real usefulness. On a discussion of this point, it is desirable not to linger amidst general phrases, but to come as directly as possible to the real substance of the proposal. It is very common and very easy for indolent, or dissatisfied, minds to turn, on every occasion, to the State, and say "the Government should watch over this, and appoint officers to prevent that and the other." A more considerate understanding will inquire, first, what is really wanted?—and then, with what certainty can the want be relieved by the means proposed? "The Government" is a well-sounding abstraction; but its operations are, after all, conducted by men like ourselves, who have no patent of infallibility, and are apt to be very strangely chosen. What reason is there to conclude, that an advantage will be gained, by trusting one set of men rather than another, if this be all that you can practically arrive at? These would be some of the questions occurring to a rational mind, in the first place, were an *effectual* transfer of the control under discussion.

An entire transfer of the management of railways to the State—if railway management, as it now exists, cannot be safely left to present laws, or to any future laws that may be justly enacted for their government—would, indeed, be a clear, and the only consistent, or promising, course. Taking for granted what has been said by the advocates for further coercion, that "private bodies ought not to be left in charge of our public roads"—admitting that the administration of them has been as bad as it has been notoriously the reverse—allowing that there is any practical case, which may be denied altogether, for desiring an organic change—this is the only change that can be safely adopted. If the necessity exists, as above stated, let all those roads be taken bodily out of the hands of their present managers: let them be wholly handed over to the State. Let some one party have the complete and exclusive charge of working them; without which they cannot be otherwise than ill worked.

It is true that the promise of such a change would not be very encouraging to those who, from the example of extant government establishments, must form some notion of what railways would become under the same kind of control. To cashier the present managers, and take shelter under official wings, in the expectation of finding greater care for public convenience, a readier adoption of improvements, more civility, despatch, and common sense, in the daily transaction of the business, will seem a strange notion to those who have had much practical knowledge of either. Still, if we must have the Government called in—if those who have made these works cannot be trusted to conduct them, under the strictest directions of the law—the plain and proper course is to take from them all power and all responsibility, and lay both wholly on the State. We shall then know with whom we have to deal—on whom the duties and liabilities of this business rest. We shall, also, know that the new authority is in a condition to manage it with some effect; and see where the merit of improvement, or the blame of deterioration, is to be imputed. We shall have no lame excuses for error, on the score of imperfect powers; and those who undertake the control will, as it is just, and, indeed, necessary that they should, bear the real burden of the work on their shoulders.

But this is nothing like what the Railway Commissioners proposed. Their plan was, to introduce a system of control without effectual responsibility; a shifting something like power, to be assumed when it may be convenient, and thrown off when the obligations attendant upon it are found onerous. The office of the State, on this plan, would be a nondescript, hovering between the duties of judge, informer, and constable—all these functions being, in turn, entrusted to one and the same body. The railway manager, the railway board, is nominally left in charge of all—is burdened with the responsibility for all; yet it is so arranged that they shall never feel their hands free for a moment—know that they have really the control of the establishment, which can only be kept in good order by commanding the most strict obedience—or foretell at what hour they may have to wait upon some Whitehall officer, empowered to examine the company's servants upon oath, rummage the books and papers, and hold up to their eyes a long list of frivelous delinquencies created by the bill, with heavy fines attached to them. Under such conditions, which it lay in the essence of Mr. Strutt's plan to introduce, could it be expected that any respectable man, much more any one of the better class, required for the office of manager or director, will be willing, nay, will able, to execute a difficult and anxious charge? Can it be believed that a method, calculated to produce disorder, discontent, and relaxation in duty of all kinds, and to drive every individual of spirit or character out of the offices exposed to such vexatious visitations, would be a means of improving railway management?

One effect it was certainly well calculated to produce. A numerous tribe of ministerial underlings and *protégés*, half-pay officers and election jobbers, hangers-on of influential peers—in short, the whole "tag-rag and bob-tail" of hungry waiters on men in place, would have had a new El Dorada opened to them, at the expense, be it remembered, of the unfortunate railways. To these agents, and to the dispensers of the patronage bestowed on them, the system would be highly pleasing, no doubt; but that the quartering on our railways of an army of this miscellaneous class, to take notes, and hold inquiries, and report formal omissions, would in any way promote the safety or order of the system itself, may be emphatically denied. The first serious objection to this array of inspectorship is, that it would most certainly be formed for the greater part of persons wholly unqualified for the superintendence of the experienced men who now direct our working lines. But it must further be asserted, that merely casual inspection, even if exercised by the fittest men in the universe—who will scarcely be found in the lists of Whitehall—could not lead to good, and might often enough do harm. There can be no divided control safely applied to a machine of this nature; and those only can properly control it who are daily, hourly—altogether, indeed, engaged in its operations. To these full power must be left—of course, under responsibility to law. Whatever impairs either—and you cannot weaken the one without laming the other—is merely so much taken from their efficiency; and, if much is taken, all efficiency is at an end. This subject will deserve to be noticed a little more closely, as it is of the utmost practical importance that it should be clearly understand in any discussion of new regulations.—*Daily News*.

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EXTENT AND COST OF RAILROADS IN THE UNITED STATES.—The newspapers are publishing a table of the railroads of the United States, stating their extent at 5076 miles, and their cost about $123,000,000. The table is very imperfect, and fails to present the whole truth on the subject. More satisfactory statistics may be found in the *American Almanac* for 1848. By a careful examination of these, we arrive at the following results:—January, 1846, there was in New England 1074 miles of railroad, constructed at an average cost per mile of $38,609 18½ c., or a total cost of $39,226,922 33 c., the first roads being completed in 1835. In 1846 and 1847, 34 more roads were chartered by the Massachusetts Legislature, which will probably cost $12,500,000. In New York, at the same time, the aggregate length of railroads completed was 758 miles; cost per mile, $23,054 16 c.; total cost, $17,475,653. The total length of railroad completed out of New England and New York, was 3870½ miles. The table in the *Almanac* does not contain returns of the cost in every case. The average rate per mile, where returns are made, is nearly $25,000. This, we suppose a fair average for all. The result will then be—miles of road, 3870½; cost per mile, $25,000; total cost, $96,762,500. Nearly all these roads have been completed within the last 12 years. Here then is a summary:—Railroads in the United States, 5706½ miles; cost of construction, $168,464,475. If we take into calculation the railroads now in process of construction, and those that will be put under contract between this and 1850, we may estimate that, by that year, the enormous sum of $200,000,000 will have been invested in railroads, in a period not much exceeding 15 years! The investment is generally a profitable one. The average dividend on all the New England railroads, in 1846, was 7 per cent.—*Washington Era*.

## THE PATENT FUEL COMPANY.

TO THE EDITOR OF THE WEST KENT GUARDIAN.

SIR,—I notice in your paper of the 11th inst. a report of the adjourned meeting of the Diamond Steam-Packet Company, in which sundry charges are made against the Patent Fuel Company, for supplying the Diamond Steam-Packet Company with bad fuel, as also with short weight to some considerable extent per *Flying Fish*, and throughout the whole of this report the title of the Patent Fuel Company is used. I am, therefore, directed to request you to state in your next paper, that the Patent Fuel Company have never had any connection with the Diamond Steam-Packet Company, nor have they any wharf at Gravesend, nor are Messrs. Elkins, Fletcher, and Rackstow, their agents. I have had occasion to correct in your paper a similar erroneous report as to the company supplying the fuel used by the Diamond Steam-Packet Company, about 12 months ago, when it appeared that the fuel referred to was supplied by Wylam's Steam Fuel Company, of Newcastle and Great St. Helen's, London. This possibly may be the case now. As some injurious reports have reached me (even this day) in reference to the fuel used on board the South-Eastern Steam-Packet Company's steamers to and from Ostend and Boulogne, I take this opportunity of publicly stating that that also is not the Patent Fuel Company's fuel.

I shall take it as a favour if you will in any future report be more particular in designating the title of the company you may refer to, and this becomes the more necessary in consequence of the great injury such reports left uncontradicted might do to the large contracts this company have for their fuel with the Lords of the Admiralty, the Peninsular and Oriental Steam Navigation Company, and other parties. I am, Sir, your most obedient servant,

15, *St. Mary Axe, Dec.* 18. WM. NICHOLAS DE MATTOS, Sec.

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SUBMERGED STEAM PROPELLER.—*(From a Correspondent).*—This improvement in the method of propelling steam-boats, is a clever, scientific invention, by Mr. T. B. Simpson. The invention has been tested in several experimental trips on the river, in a small steamer called the *Albion*. The submerged propellers are fitted to the little vessel, though she is not a craft adapted to test the full value of the invention—being far from handy, and extremely crank; she is disproportioned, both as respects her extreme length and want of breadth of beam; and the singularity of her appearance is heightened by the absence of paddle-boxes, and the invisibility of any machinery, or propelling apparatus, to force her through the water. So far, she looks like a screw propeller; her paddles are fixed in the sides of the vessel, and are situated beneath the water line. Her place of starting is generally the Brunswick Wharf, Blackwall; and many curious spectators are congregated to witness her departure, doubtless with the expectation of detecting, when her engine was in action, the mystery of her motive power. In this expectation, they are destined to be disappointed; for the mystery remained even after she is seen to depart, and still continues a mystery, from the peculiar construction of the vessel and her machinery. The submerged propellers consist of wheels, acting horizontally or vertically, in a case, entirely underneath the water. Those used in the *Albion* are constructed of four plain leaves, or floats, fixed on a vertical shaft, surrounded by the case; this case is a concentric circle, rendered eccentric by its position, with relation to the wheel, which it exceeds in size, sufficiently to give effect to centrifugal action of the water. The three problems of the most effective method of supply, the delivery, and, above all, of the best direction of the course of the water, appear to have been solved with great ingenuity by the patentee. The principle of the invention may indeed more briefly be stated to consist in the ejectment of a column of water in a parallel line with that of the vessel's motion, which column acts against the water outside the vessel. The patentee's theory is, that, as a swan swims onward, the columns of water, beaten back by the feet, act as powerful propellers, by beating back the dense mass of water with invisible, but irresistible, force. Nothing can be more beautiful than the noiseless and mysterious motion of Mr. Simpson's boat. There is an entire absence of all surface swell, and the vessel steals rapidly through the water as if propelled by some magical power. By a beautiful contrivance, the case is constructed so as to change its position on the wheel—being reversed when it assumes the same form as going a-head—and the wheel and case perform the same office as before, with the greatest precision. The diameter of the submerged propeller wheels of the *Albion* is only 24 inches; and the wheels necessary to be used in a boat of 300 or 400 tons burden, would not exceed 30 inches in diameter. This is one of the most extraordinary features of the invention—the diameter of paddle-wheels employed in steam-boats of similar tonnage being now nearly as many feet. The adaptation of this method of propulsion to canal-boats and narrow rivers, is a desideratum long wished for. The invention is one which cannot fail to attract the attention of the scientific world; and the uninterrupted course of experiments, conducted with indefatigable perseverance by the patentee, leaves nothing further required to ensure success.

RAILWAYS.—A "continuation" return, moved for by Mr. Moffatt, M.P., shows that the gross total length of all the lines of railroad for which Acts were passed last session (1847), amounts to 1353 miles; the gross total amount of capital stock to 25,686,257*l.*; the amount of capital actually subscribed to 11,702,951*l.*; and the gross total sums of money, which the companies are empowered to borrow, to 13,764,871*l.* So that, adding the amount of capital authorised to be borrowed to the original capital stock, it would appear that it was proposed to appropriate the enormous sum of 39,460,228*l.*, or nearly 40,000,000*l.* sterling, to the construction of new lines of railroad!

ABERDEEN RAILWAY.—Mr. Cubitt reports that—"The works of every contract are in progress, and, in the whole distance from Friockheim to Aberdeen, there is not a single unsound or improper piece of work. The numerous bridges and viaducts are all well founded, and certainly well built, and show no signs of settlement or failure, although many of them are very large and important—amongst which," he continues, "I would take as a specimen the viaduct at Fetteresse, on the Carron contract, near Stonehaven, which is completed, and carrying a heavy traffic of earth and stone waggons, for the completion of the embankment beyond it, and there are several other viaducts of the same kind in various states of forwardness, consisting of from 3 to 13 arches, varying from 30 to upwards of 70 feet in height, all equally good; as are also the few iron and many stone bridges on the line. In short, I do not know that I can express my opinion stronger than by assuring the board that, as far as I can see, I should have no objection in risking my own credit as an engineer upon all or any of the works I have seen in progress from one end to the other of the line."

CALEDONIAN RAILWAY.—The opening of this important railway, as a through line of communication between London and Edinburgh, may now be announced as an event on the eve of consummation, in proof of which we may state that, on Friday last, Mr. Addison, the resident engineer of the company at Carlisle, accompanied by Mr. Mould, chief agent of Messrs. Stephenson and Co., the contractors, and a party of their friends, performed the journey between Carlisle and Edinburgh in one of the London and North Western Company's first-class carriages. The only interruption experienced proceeded from the workmen on the line, who had assembled at various points to "cheer them on their way," which they did in good style. The line to Glasgow has been completed for some time, so that nothing now remains but minor arrangements to enable the directors to open this great line to the public.

PARIS AND LYONS RAILWAY—STATE OF THE WORKS.—We intended to publish a complete account of the state of the Paris and Lyons works; but, for want of room, we are compelled to postpone to our next number the interesting details we have procured. We shall, therefore, confine ourselves today to mentioning the principal facts, the communication of which to the public ought not to be delayed. We shall begin by announcing that the section from Dijon to Chalon has been received by the company from the Government's engineers, and that, according to every probability, that portion of the line will be opened about June next. The foundations of the Paris terminus are almost wholly finished. The works have advanced so much on the remainder of the line, that, as would appear, if they stimulate the zeal of their contractors, and pecuniary means be not wanting, the company must be enabled to open the line from Paris to Tonnerre in September. All their efforts may, therefore, be soon concentrated on the part that separates Tonnerre from Dijon, in order to connect, as promptly as possible, the three sections dividing the road between Paris and Chalon-sur-Saone. The tunnel of Blaizy is wholly bored through; the archway is almost finished, and the ground is lowered nearly to the level of the future road—all the wells are opened. With such a favourable state of things before us, we shall insist on the absolute necessity of leaving no section between Paris and Marseilles unfinished, not in one part more than in another. Yet, the works between Chalon and Lyons are not commenced, and the company will, no doubt, be stopped in that part by the exhaustion of their capital. In such a situation, we believe, we may predict that the support of the public and Government will not be wanting to the company; we need no better proof of it than the concessions already obtained last year, owing to the fair appreciation of the company's just claims, and the immense public interest involved in the prompt completion of the Paris and Marseilles line.—*Journal des Chemins de Fer* of the 18th inst.

A BANKRUPT RAILWAY CONTRACTOR.—At the Court of Bankruptcy, on Thursday, Thomas Burton, a railway contractor, of Commercial-road, Lambeth, was examined. The bankrupt had, it was understood, at the present time, a contract with the London and Birmingham Railway Company, to prepare 20 miles of rail, at a cost of about 170,000*l.* There were upwards of 300 creditors, whose debts amounted to about 60,000*l.* A short time since, the bankrupt proposed to pay them 20*s.* in the pound, and interest, within 12 months; but certain creditors refused to accept the proposition, and hence the present bankruptcy. After some discussion, assignees were chosen.

THE PRE-EMINENCE OF HOLLOWAY'S PILLS, FOR THE CURE OF BAD DIGESTION AND LIVER AND STOMACH COMPLAINTS.—The superiority of Holloway's pills, as a safe and effectual remedy in all cases where the stomach is deranged—the digestion impaired, or the liver diseased—is universally acknowledged by all classes of society throughout the civilised world. For the cure of those complaints, they surpass every other medicine hitherto discovered: they act so directly upon the disease, that sufferers need only to give them a trial to be convinced of their efficacy, particularly those persons who have had their maladies aggravated by a long residence in India.—Sold by all druggists, and at Professor Holloway's establishment, 244, Strand, London.

# Transactions of Scientific Bodies.

*MEETINGS DURING THE ENSUING WEEK.*

MONDAY.....Geographical—3, Waterloo-place ..... 8½ P.M.
TUESDAY.....Zoological—11, Hanover-square..... 9 P.M.

## On Mining, & the Practical Applications of Geological Science.

PROF. ANSTED'S LECTURES, AT KING'S COLLEGE.

LECTURE XI.—THE PRACTICAL APPLICATION OF GEOLOGICAL SCIENCE TO MINING—THE NEWCASTLE COAL MINES—*(Continued.)*

Professor ANSTED said, that the topics on which he should treat in that day's lecture, would be confined exclusively to the phenomena connected with those accumulations of gas in coal mines which caused explosions; and he selected this opportunity, partly because the subject arose naturally out of that of ventilation in coal mines, being also itself a distinct subject of the greatest possible importance, and also because public attention had been called to it, by the frequency of explosions and the great loss of life which often accompanied them. The application of means to prevent these direful accidents was a subject of the greatest importance, as regarded the internal economy of the mine; and he should, therefore, have to consider the circumstances under which accidents of this kind might be expected to take place; and if, on examination, they seemed to be unavoidable, the possibility of so managing the mines as to involve, at any rate, a less fearful destruction of human life. This was a subject which had many times attracted the attention of the public, and of various scientific bodies. He (Professor Ansted) had had the honour of stating the result of his inquiries at the meeting of the British Association for the Advancement of Science, held at Cambridge, in 1846, and the heads of what he had then said was published in the reports of that body, and were also printed at the time in the *Mining Journal*. He mentioned this circumstance because, in those reports, certain methods of prevention were suggested, which, he continued to think, would, if carried into execution, have been of great service in some cases which had occurred more recently.

The danger of explosions in coal mines arose, no doubt, from issues of gas proceeding from the coal itself. He had already had occasion to mention more than once the fact that gas was constantly given out by coal; not only when exposed to heat, or unusual compression, but also under ordinary atmospheric conditions. When any one went into a coal mine for the first time, they would probably notice a peculiar singing noise, which, though it was not easy to understand, there was no doubt arose from the issue of gas from the coal. It was not known with certainty, whether this arose from the bursting of certain small vesicles in the coal; or whether, in consequence of the pressure of the gas on the successive films of which the coal was made up, the singing noise resulted from the gas coming out, as it were, in the form of a thin plate. Certain it was, that in coal mines, there was this unusual noise, and that it was connected in some way or other with the presence of gas. This noise was heard unceasingly in mines of certain kinds of coal, and in every such case, therefore, measures must be taken with regard to its results. The quantity of gas thus produced, varied, however, very much, according to the nature of the coal and the amount of atmospheric pressure, which appeared to be the two principal causes which regulated the issue of gas from the fractured surface of the coal. In order to give some idea of the quantity of gas sometimes given out, he might mention, that in the Bensham seam, which was known to be a particularly fiery one, gas was thrown out so rapidly, and in such purity, that, by boring a little hole in the mineral, and applying a light, a jet of flame would be produced. In this case, the gas would be in too pure a condition to be explosive, because, to make it so, a certain admixture of atmospheric air was necessary. The quantity of gas thus given out naturally "by singing," from four acres of coal, was ascertained, some time ago, to amount to 10,000 hogsheads per minute. Seams of coal, however, varied very much in this respect, and some contained scarcely any gas at all. Besides this constant issue by singing, there was another way in which the gas was met with—namely, in what were called "blowers:" these were puffs of gas, sometimes taking place at long cracks, or at faults, and at others at mere holes; they were sometimes very common, and produced as much gas as served to light certain parts of the mine—as, for instance, the principal passages; and thus, indeed, was the safest possible way of getting rid of it. In the Killingworth Mine there was a "blower," which had been burning for some years. In other instances, a fault was touched, which gave out gas, and when the same fault had again been pierced, it had produced no gas. Sometimes, as in the case of the Great Jarrow explosion, when the works approached near a fault, the pressure of the gas pent up in it had forced forward the coal, which divided it from the mine, and involved all the workmen in certain destruction. These were all very difficult circumstances to deal with, as it was impossible to anticipate them. Besides these blowers, which occurred in the natural state of the coal, there were constantly dangerous accumulations in portions of the mines which had been worked out, or partially worked, and in which the roof had partly fallen down. It was impossible to prevent these accumulations where the roof had fallen, and in old workings; and they were always, more or less, dangerous, because the gas was here inevitably mixed with atmospheric air, and generally in such proportions as to be highly explosive: they were also not uncommon in faulted districts—where the beds were in a broken state, the result of contraction, or pressure, at some remote period. In all these cases, accumulations of gas took place, and the gas was liable to burst forth on the smallest atmospheric change. If, for instance, a fall in the barometer indicated that the pressure of the atmosphere had become less, its existence would not be so great, and a quantity of compressed gas would be forced out by expansion. Gas being thus present in the mines, either in the body of the coal itself, or in accumulated quantities, the danger arose from the fact, that it was impossible to conduct mining operations underground without lights. The most convenient way of lighting, according to the miners, was by candles; and this, partly, because they were easy to carry about, and partly from long custom. There was a great prejudice in favour of candles, which they always would use wherever it was possible. Now, it must be remembered, that generally part of the mine only was liable to the ordinary issues of gas, while other parts were subject to what might be called extraordinary issues, such as arose from unexpected accumulations. In the former case, the use of open lights would be perfectly safe, provided the general ventilation were tolerably good. Thus, it might be considered, that, under ordinary circumstances, such parts of the mine would be safe, and the other parts dangerous; and it was generally found, that if the workmen were allowed to use candles in the safe parts, they did not object to use lamps in the dangerous portions. But the condition of any district was always liable to be disturbed by new blowers commencing, or by the influx of gas from the dangerous districts; and, therefore, a vigilant superintendence of the state of the mine was indispensable. It was also necessary, if anything was to be done in the dangerous parts of the mine, that light should be obtained by safer means than by candles, because the smallest contact of flame was sufficient to explode certain mixtures of carburetted hydrogen gas and the atmospheric air. The explosive admixture was a mechanical one, and it was necessary to understand precisely of what proportions it was formed. If the gas came out pure, and a candle was thrust into it, the flame would be extinguished, because there was nothing to support combustion; but the gas itself would take fire. If there were three parts of atmospheric air and one of gas, the mixture would be incapable of supporting combustion; but when it was composed of five parts of air and one of gas, it began to be faintly explosive; and, when once explosive, it would set fire to other gas, which was too pure to explode. When the gas was as 1 to 6, it became very explosive, and continued so until the proportions were 1 in 10, when it began to be less explosive. The danger, however, was not destroyed until the mixture became weaker than 1 part of gas to 14 of air; after that it merely enlarged the flame of any light which might be brought into it, and turned it blue. The miner was thus enabled, by the lengthening of the flame of his light, and its appearance, to tell whether he was in a dangerous part of the mine, and the amount of gas that might be present in the atmosphere. If the flame reached to a certain height, the practical miner could tell at once how nearly the atmosphere approached an explosive combination, and with some other similar points affecting his safety, and that of his fellow workmen, long habit had made him familiar.

There were several considerations of importance connected with these explosive admixtures of gas and air; as, for instance, the effect produced by the breathing of a number of men, which very much lessened the danger, by altering the proportions of nitrogen and oxygen in the atmosphere; and thus one portion of the mine would be less explosive than another, though both might contain the same proportion of carburetted hydrogen.

Every part of the mine which was capable of being worked, should, in all cases, be visited with guarded lights, before other lights were allowed to be taken; and the state of the mine should always be well ascertained before open lights were used. There was also a certain amount of danger in going into some portions of a fiery mine; and, until within the last 30 years, the only means of obtaining any degree of light in such cases, was by the use of an apparatus called "the steel mill." This was a very ingenious contrivance, by which a stream of sparks was produced by pressing a flint against a revolving plate of steel; and this afforded sufficient light to move about, but not enough to work by. It was, moreover, a dangerous contrivance—for, every now and then, there could be no doubt, a flame was produced, sufficient to explode gas under certain circumstances, and particularly if olefiant gas should be present, which, however, did not appear often to be the case in English mines.

About 30 years ago, a great number of serious accidents occurred in the mines of the north of England, following each other in alarmingly rapid succession. Very many lives were lost, and the public attention was much directed to the question whether, or not some improvement could not be discovered in the way of lighting the mines. Sir Humphrey Davy, then in the zenith of his reputation, was applied to by Mr. Buddle, a well-known colliery viewer of that day, and invited to turn his attention to the subject. Humboldt had before attempted to overcome this difficulty; but his contrivance was only partially useful for visiting dangerous mines, as it would not burn longer than half an hour, the flame being supported by a reservoir of atmospheric air within the lamp. Dr. Clanny improved this lamp, admitting the external air freely in cases when it was used in an explosive mixture; but this lamp was practically useless, as the explosions which took place inside it soon put out the light.

The learned lecturer then proceeded to explain Sir H. Davy's invention, illustrating it by various diagrams, and by a "Davy-lamp." Its principle was founded upon the discovery, that the explosion of the mixture in question did not pass through small tubes; and after numerous experiments, Sir Humphrey Davy found, that the length of the tubes was of no consequence, but that wire gauze, the apertures being of the proper dimensions, answered the same purpose. By this means, all necessity for an exterior glass was got rid of, and the new lamp might be carried into the most explosive admixtures without danger. Such was the Davy lamp; and he believed that, as it was the first, it was also by far the best, real safety lamp that had been invented. It was, perhaps, not perfect, judging only by experiment; but it was decidedly the best for all practical purposes, as it was more manageable than any other, and not so easily put out of order. The gauze usually employed was made of iron wire, and had 784 holes to the square inch. Sir H. Davy, having perfected his lamp, went down to the Newcastle coal field, and, with Mr. Buddle, traversed with impunity some of the most dangerous parts of the Bensham seam, at that time the most fiery known. The Davy lamp had been used with great success ever since; and, though some accidents had occurred under circumstances in which no lights, but those of Davy lamps, were present—it was as safe as any such instrument could be. The superiority of this lamp over more recent inventions consisted in its producing a greater quantity of light, and being more portable, with at least as much safety. Mr. George Stephenson, the engineer, had also invented a lamp, which was called a "Geordie," after the name of the inventor. It was, however, merely a modification of the Davy lamp, by the addition of a glass tube, which answered the double purpose of increasing the light, and keeping the flame steady, by shielding it from currents of air. This, perhaps, gave it additional safety while perfect, as it was possible to drive an explosion of common street gas through the gauze of a Davy lamp. The glass, however, was liable to be broken, and then the instrument became a large and somewhat dangerous "Davy." In some of the Belgian mines a lamp, called "the Musseler lamp," was in use, but it was a very complicated affair, and for that reason was inferior to Sir H. Davy's invention. No doubt, it was safer theoretically, as by it the flame was extinguished the moment the lamp was taken into a dangerous atmosphere; but this very much lessened its utility, the main point being that the lamp shall give light with safety under such circumstances. The Davy lamp, with care, might be taken anywhere. He (the lecturer) had himself been in every description of atmosphere, and he had often seen explosions take place inside the Davy lamp by which he was lighted. This, indeed, was a circumstance which happened constantly to every viewer, over-man, and Davy-man in the Newcastle coal field. The true danger of the Davy lamp was one that would apply equally to any other, and it arose from the fact, that its constant use made the workmen careless, and the more it was used, therefore, the greater chance was there of accidents. The learned lecturer here exhibited a printed placard, setting forth the regulations which were adopted in the Wall's End Colliery in respect to Davy lamps, the most important being that which enacted that no man should be allowed to use his Davy lamp until it had been examined carefully by the Davy-man, and pronounced perfectly clean and in good order, nor until it was securely locked, so that the workman could not take it to pieces, and expose the flame in an ungarded manner.

With regard to actual accidents, the professor remarked that he should not say much beyond placing before them the circumstances of a few of the most disastrous, which would serve to explain the nature of the results of the explosions of which he had explained the cause. The most important, then, that he should mention, occurred in the Haswell Colliery, on the 28th September, 1844, when 95 lives were lost; and the next was that at the Jarrow Pit, on the 3d of August, 1845, when 41 persons were killed. In the same year, 36 lives were lost at Killingworth; and in 1846, 19 at Oldbury and 36 at Risca. By these accidents occurring within a period of little more than two years, upwards of 200 persons lost their lives; and he had grouped these accidents together, in order to give an idea of the extent to which they occurred. There were, then, 200 lives lost in two years in working coal mines from accidents, which, in the opinions of the juries who held inquests on the unfortunate sufferers, could not possibly have been prevented—the mines being in every case, except, perhaps, in that of the least considerable, in good condition at the time.

In the first of these accidents, that of the Haswell Colliery, there were underground at the time of the accident 99 persons, of whom four only escaped. It was an important consideration (which also applied to other accidents), whether it was absolutely unavoidable, the catastrophe having occurred, that all these people should be killed. It might be that the whole matter was beyond human control, as in the case of a shipwreck. If we crossed the sea, the vessel, being made by human hands, was liable to accidents which might happen from stress of weather, which no one could help; or by carelessness, in respect of which some one would be culpable. If everything were done to render the vessel seaworthy, there would be no blame attaching in respect to its condition, though the vessel should be wrecked in a storm; but, if the vessel were sent to sea in an unsafe condition, there was blame. Just so was it with regard to mines: if the mine were in as good a condition as science, and the adoption of the best plans, could make it, no blame might be attributable to any one for an unforeseen accident. But, if it were possible so to manage the mine as to lessen the chances of accident—(he did not believe accidents could be entirely prevented); and if that were not done, then there would be blame. The sea must be crossed, despite of shipwrecks; and coal must be had, let it cost what it might; the point was to get it under the most favourable circumstances. In the case of each accident, therefore, it was important to consider whether everything was done by way of prevention and palliation which could be done. In the case before them, that of the Haswell Colliery, the accident occurred in a part of the mine where the pillars had been removed and the workmen were taking away the props. This was always a delicate operation, because, the props being removed, the roof fell, and the accumulations of gas were disturbed, and often shifted. Before proceeding further with the particulars of this melancholy accident, it would be necessary to mention the effects of an explosion upon the atmosphere. The carburetted hydrogen when exploded became decomposed; the oxygen in the atmosphere mixed with the hydrogen and formed water, and nothing was left to breathe but pure carbonic acid gas. This was a most poisonous gas, and produced instant death by choking. At least, insensibility was instantaneous; and, although in such cases, when measures were taken almost immediately, recovery had taken place, death was generally inevitable. The result of an explosion, therefore, was to turn the atmosphere into pure carbonic acid gas; and every man in that district of the mine, in which the accident occurred, was doomed to certain death. The Haswell Mine was divided into three great divisions, or three pannel workings; the explosion took place in the middle division, and 30 or 40 persons, far removed from the scene of the accident, in another pannel, were poisoned by the after-damp. This could not have occurred had the ventilation of each pannel been as distinct as it might have been; and—he was, therefore, bound to say—as it ought to have been. The explosion at the Jarrow Pit, in August, 1845, by which 41 persons were killed, was another instance where such a large destruction of human life was occasioned by the absence of two shafts; for the means of ventilation at the only one being destroyed by the accident, there was no means of restoring it previously to the mischief being done. Another interesting case occurred in the Killingworth Colliery in 1845, which was the result of a fault. On one side of the district there was a long stone drift, at right angles to the main rolley-way of the pannel, in which the men were working; a fault was reached, and this gallery not prosecuted beyond it. The chief object was to drive through a mass of coal in order to get the ventilation completed, and for this purpose they were at work day and night. The fault was pricked in the course of the work in a succession of places, up to two or three days before the accident (which took place on a Thursday), without any unusual presence of gas being observed. On the Wednesday the fault was once more pricked, and no gas came out. On Thursday, one set of men had performed their allotted portion of work, and about two hours afterwards another gang of workmen descended; and it is singular that, though the gallery was considered so far dangerous that the men were working with Davy lamps, a boy was allowed to precede them with an open candle—a piece of carelessness most inexcusable, and for which they paid with their lives; before they reached the spot where the workings were, an explosion took place, and every person in the mine perished. Some idea of the force of these explosions might be deduced from the fact that, on this occasion, a stopping consisting of 36 ft. of rough materials, with an inch and a half brick wall on either side, was blown to pieces. In another instance, at the Jarrow Mine, an accident happened, and on examining the mine afterwards, a cavity was found, in which there had been probably about 200 cubic feet of gas in a very condensed state, and the side of the cavity being reduced by the working, it had given way, and let out the whole, which exploded with irresistible force. This was a kind of accident to which the miners were constantly liable, and which no vigilance could foresee or prevent. Accidents, and all their particulars, ought always to be recorded, and they could not be discussed too much. It was quite clear that, although it was impossible to avoid accidents, the risk was greatly diminished by good and effective systems of ventilation, and by unceasing care in the use of lights.

[The succeeding lecture, which contains a description of the other coal fields of England, and those of Wales, will appear in our next week's Journal.]

## GEOLOGICAL SOCIETY.

DEC. 15.—Sir H. T. DE LA BECHE (President) in the chair.

J. North, Esq., and T. F. Gibson, Esq., were elected fellows.

A paper "On the Mineral Character and Fossil Conchology of the Great Oolite, in the neighbourhood of Minchinhampton," by J. Lycett, Esq., was read.—A letter from Col. Mackintosh to J. C. Moore, Esq., was read, relative to the depression of the land on the shore of the Bay of Naples. At the Hospice of the Capuchins, between Naples and Puzzuoli, the water is now so high as frequently to cover the floor of the building. On the side next the sea, there was formerly a vineyard, but the whole is now covered with water, and an old monk has frequently eaten grapes which grew on the spot where boats are now sailing. "A Description of a new Species of Nautilus (*Nautilus Saxbii*), from the Lower Greensand of the Isle of Wight," by J. Morris, Esq.; and an "Account of the Recent Landslip at the Lizard Point, on the 19th of Feb., 1847," by C. A. Johns, Esq., were read.

## SOCIETY OF ARTS.

Dec. 23.—BENJAMIN ROTCH, Esq. (vice-president, in rotation), in the chair.

After the usual routine of business had been gone through, Mr. SMITH WILLIAMS, after a few introductory remarks, stated that the discovery of the art of lithography was, like that of many others, purely a work of chance; it had been found out, when quite a different end had been in view. About 1795—the exact period was not known—Alois Senefelder, the son of an actor at Munich, and also an aspirant for histrionic fame, made the discovery alluded to. He was in the habit of printing the speeches which he had to study, and as copper plates were too dear, he tried tin ones: these were found to be uncertain in their action, and he had recourse to stone—a peculiar kind of stone, known now as lithographic stone, was obtained by him: this stone was remarkably porous, and he was enabled by its means to engrave his speeches easily, and to draw the letters backwards. In this state, however, he might have remained, had not chance directed it otherwise; having one day been desired by his mother to make a note of a certain household bill, and not having any pens, ink, or paper, he determined on drawing it on the stone. This was done, and the writing allowed to remain some time. It then struck Senefelder, if he bit away the stone round the writing with acid, he might be enabled to produce an engraving. The acid was applied, and thus the discovery was made. The art of lithography, Mr. Williams said, was one which required the utmost care and taste; the touches on the stone must be made at once, from the circumstance that no retouching would serve to improve that which was once done wrong. That there were four methods of lithographing—by means of chalk or grease in a hardened state, ink or grease in a liquid state, engraving with incised lines, and those lines being filled up with ink, and by transferring drawings on prepared paper to the surface of the stone. Great care was required to be taken, that the outline of the drawing should be neat and cleanly executed, and that it was properly bitten by the acid: for were it bitten in too deep, the shades would turn out black and patchy; and were it not sufficiently bitten in, the lights would be faint and imperfect. The art of lithography was an ally to engraving—not a rival, and as such it was now regarded by English artists; and, on that account, we were fast approaching a state of the highest perfection in it.—Mr. Williams was very warmly applauded frequently throughout his reading of the communication. The walls of the room were thickly hung with most beautiful specimens of lithography.

ELECTRIC TELEGRAPH IN HOLLAND.—A recent ordonnance of the King of Holland enacts, that no line of electric telegraph shall be established without the consent of the Government; that the tariff for the transmission of intelligence shall be submitted to the Ministers of the Interior and Finance; that intelligence from, or to, the Government shall be transmitted in preference to that of private individuals; that, in time of war, the telegraph shall be placed under the control of the Navy and War Departments; that when peculiar circumstances shall require it, the service of telegraphs shall be provisionally or entirely suspended; that all the news received or sent by the telegraphs shall be inscribed on registers; and that, if eventually the use of electric telegraphs shall be found to lessen the revenues of the Post-office, the proprietors of the telegraphs shall be obliged to pay an indemnity.

CHARGE OF DISCLOSING TELEGRAPHIC EXPRESSES AT NEWCASTLE.—On Monday week, a summons was granted at the Newcastle-on-Tyne police-court, against Mr. Thomas F. Dickenson, a stock and share broker, to obtain his attendance before the magistrates to answer a charge of conspiracy against the Electric Telegraph Company, he (Mr. Dickenson) having, by means of promises of bribes, which the clerks had agreed to accept, obtained from them the prices of shares, when it was the duty of the clerks to have expressed the same on to Edinburgh, and not to have communicated them to any person in Newcastle. Mr. Chater, a solicitor, stated the particulars of the case at great length, and examined the clerks in question, who admitted that they had agreed to translate the price of Consols, &c., for Mr. Dickenson, as they were passing them on to Edinburgh, for the sum of 1*l.* per day, or more, as the speculations of Mr. Dickenson might prove successful. The clerks stated that they did not consider their written instructions on this head to be so sufficiently specific as to prohibit their doing what they had done; and one of them said, in palliation, that their salaries being only a guinea each per week, was hardly sufficient to keep them. The magistrates recommended an indictment at the sessions, but Mr. Chater having urged them to grant a summons in the first instance, in order that the company might be better able to determine on the course they ought ultimately to pursue, the summons was according issued. Mr. Chater observed, that it was not the wish of the company to adopt harsh measures, but they must be protected in the enjoyment of their patent, and not be defrauded with impunity.—*Carlisle Journal.*

## THE COST-BOOK SYSTEM.

VICE-CHANCELLOR'S COURT, BEFORE SIR J. WIGRAM, DEC. 20.

CURLING *v.* FLIGHT.—This was a bill for specific performance of a contract to purchase certain shares in mines in Cornwall and Wales, which the particulars described as shares in mines. The Master reported a good title shown, and the defendant (the purchaser) excepted to that report. The case was argued during last term, and his Honour now delivered judgment:—

The bill alleges that, by a certain custom, well-known in mining districts, the names of the owners of shares in mines are registered in a book kept by the company, and called the cost-book; that, in buying and selling shares, no other evidence of the vendor's title was required, as between him and the purchaser, except the acknowledgment of the vendor's title as such owner in the cost-book. The bill prayed a specific performance of the agreement upon that principle. The defendant (the purchaser), by his answer, insisted that he was entitled to have the title to the shares made out in the usual way. Upon motion, the usual reference as to the title was directed to the Master, there being no suggestion as to the ambiguity or equivocation in the terms of the contract, or the subject-matter thereof. Before the Master the vendor insisted that he was not bound to give any evidence of title, except the production of the cost-book; and to show therein the assignments which had been made to D. Curling (his testator), which entitled him to have his name put on the cost-book, which assignment was, in fact, nothing more than an entry in the cost-book; and that such entry was lawfully made. The Master reported a good title shown. The defendant took exceptions to that report. The evidence appears to me to show, that as between the different adventurers in the mines—all of whose names were, or ought to be, registered in the cost-book—the entries of such names in the cost-book were sufficient *prima facie* evidence of the rights of the parties as between themselves; but as between those parties and strangers who might possibly claim adversely to the adventurers, the cost-book was not evidence for any purpose whatsoever. The question, therefore, which the exception raises, is, whether the defendant was bound to accept a title, which, at the utmost, only showed that he was entitled to certain shares as between himself and the present adventurers in the mines, but which left untouched the question whether the plaintiff and the other adventurers in the mines had any title to the mine itself, of which he had contracted to sell certain shares. If the terms of the agreement merely imported that the vendor was to retire from the adventure, and give up to the defendant the place which he might have occupied in the cost-book, as the holder of the shares, that might possibly entitle the plaintiff to what he seeks by his bill. But, if according to the true import of the contract, the vendor contracted to sell shares in a mining adventure, I cannot see upon what principle the court is asked to decide that the vendor is not bound to tell the purchaser what was his interest in the mine, the shares of which he was entitled to sell. The argument might be carried to this length—that the purchaser had no right to inquire whether the interest in the joint-adventure was freehold or leasehold, or was worked by license or by trespass; or what, if any, was the title which the adventurers might have acquired by such trespass or otherwise. Suppose the vendor had in the particulars of sale stated that he acquired by purchase a title to all the shares in the mine, and had offered to sell all the shares—that is, in effect, the mine itself—could the court admit the proposition that the vendor had nothing to do, on the question of title, but to show his own name lawfully inscribed in the cost-book, showing, as between himself and the former shareholders, he was sole owner of the mine? If the argument of the vendor were well founded, the purchaser might pay his money to-day, and be evicted to-morrow, without having any cause of complaint. I do not say that such a contract might not be made; but it is not the contract in this case. According to the particulars, shares in a mine, and not such interests as the plaintiff might have, were the subject of sale. It was said, however, that unfortunate consequences, or, at all events, an argument leading to absurdity, might follow from such a decision; that if the court once holds that the cost-book is not conclusive evidence on the question of title, it would be to decide that the vendor of a share on a going partnership would be bound to make out a marketable title to every article constituting the partnership assets. To show the absurdity of such a conclusion. it was said that if a partner in a brewery, with the consent of his copartners, were to sell his share *eo nomine* to a third person, the purchaser might require that a marketable title should be shown to every part of the partnership premises, including every public-house, the stock of the firm. I mean to decide no such point. The title which a purchaser may require must vary with the subject-matter, and the terms of the contract. The partners in a brewery might very well agree among themselves to purchase, as part of their stock, property, the title to which was known to be unmarketable, or to acquire such property for a bad debt; it might be that a purchaser of a share *eo nomine*, of a retiring partner might, in the absence of special circumstances, be bound to take such title as a vendor had. But that would not excuse the vendor from showing what the title of the partnership was in the aggregate concern. Suppose the partner to have known that a title could not have been made, and the purchaser could prove such fact, would the court compel specific performance of the contract? Confessedly not. If the vendor is not bound to show this title, how is the purchaser to know whether he has got the subject of his contract? All that I decide is, that the vendor in the present case cannot simply refuse to show the title of himself and his coadventurers to the mines, the shares of which he had contracted to sell. Exceptions allowed.

## ACCIDENTS.

*Raffle's Quarry, South Shields.*—Ambrose Coe had his leg broken here from a fall of earth, in consequence of which he died in a few days.

*Bowling Colliery Company, East Bierley.*—A fire-damp explosion occurred on Saturday last at one of the pits of this company, whereby no fewer than 11 men and three boys were all more or less severely scorched—one of the sufferers, a youth named Barrett, has since died. The accident arose from one of the men suffering a hole to remain in the gauze of his Davy lamp. At the inquest, a verdict of "Accidental death" was returned

*Caution to Colliers.*—Another instance of the recklessness with which some colliers prosecute their dangerous occupation took place a few days ago in a coal pit near Bilston. Some colliers descended the pit in question about 6 o'clock in the morning. One of them, Richard Thompson, was cautioned by another collier not to go up a gate-road until it had been properly examined by the doggy, but Thompson persisted in his original intention, and took with him a lighted candle. After he had proceeded some distance an explosion of fire-damp took place, and Thompson ran back, badly burnt about his arms, back, face, and breast. He was taken home, and was subsequently attended by Mr. Dunn, surgeon, of Wolverhampton, but after lingering from Monday to Wednesday morning, he died in consequence of the injuries he had received.—*Wolverhamton Chronicle.*

*Tividale, Sedgley.*—D. Jukes, a miner, was killed in a pit here, belonging to Messrs. Mason and Co.

*Priest Fields Porto Bello Colliery.*—James Cleyman was killed by an explosion; he was blown out of the cage while descending the shaft, fell in the sump, and was found dead.

Wm. Pitchford was killed in the same pit, by a fall of coal.

*Bullhouses Pits, near Penistone.*—A young man, about 17 years of age, had just descended the shaft, and was getting out of the corve at the bottom, when the other corve, which had been raised out of the pit as the one in which he was descended, fell down the shaft, and killed him upon the spot. It appears that the corve had been lowered rather suddenly upon the landing at the pit mouth, and becoming loosened from the rope by which it was suspended, fell down the shaft.

*Dreadful Accident at the Chapeltown Iron-Works.*—On Friday, an inquest was held at the Sheffield General Infirmary, on view of the body of William Childs, aged 68, whose death resulted from the following accidental circumstance. The deceased was one of the men employed at the extensive blast-furnaces at Messrs. Scholefield and Co.'s Iron-Works, Chapeltown; and, on the 19th of Nov., took charge of the furnace of which John Crowther was the regular keeper, but who was absent from his work on that day. There were between 4 and 5 tons of metal in this furnace, which was being melted by blast-heat, in order to be run into pigs. On the evening in question, the deceased was preparing to let off the liquid metal from the furnace into the moulds, and had driven the piece of iron through the "stopper," or clay composition, when he found considerable difficulty in withdrawing it. In endeavouring to do so, the whole piece of the clay composition became loosened. A man, named Richard Armitage, observing this—though it appeared to escape the attention of the deceased—knew that the weight of liquid metal in the furnace would, in a few minutes, force its way—thus leaving an outlet for the metal from 12 to 14 inches square, instead of one of 3 inches diameter, which the deceased was making. He immediately called out to the deceased—"Childs, come out of the way—the stopper's loose, and coming out altogether." The deceased neglected the caution, and continued to exert himself to get the bar out of the hole he had been making, when the whole piece gave way, and the liquid metal came in a flood upon him; and, before he could get out of the way, he was almost up to the knees in a pool of the boiling lava. Armitage immediately seized him round the waist, and lifted him out; but his feet and legs then presented a most frightful spectacle. His clothes, and the flesh about his ancles and legs, were burnt away, and his boots were also burnt to a cinder. In endeavouring to cut them off his feet, the flesh of the heels, &c., came away. At the poor man's own request, he was immediately removed to the Sheffield Infirmary, where he lingered until Wednesday week. The evidence of the witness, and the statement made by the deceased to his relatives, showed the lamentable occurrence to have been entirely accidental, and a verdict to that effect was returned by the jury.—*Sheffield Iris.*

IRISH ELK.—The greater portion of a skeleton of the ancient Irish elk, in a fossil state, was discovered last week at Timahoe, in the Queen's county, by some labourers employed by Mr. Joseph Edge in sinking a new mill-course. The remains were discovered at a depth of 8 ft., in a gravelly stratum, beneath some moory land, for many years a level meadow. The earth enclosing the skeleton had all the appearance of having never been disturbed. The head and antlers were preserved by Mr. Philip Cooper, of Timahoe.

NEBULA OF ORION.—The eighth annual meeting of the American Association of Geologists and Naturalists has been held at Boston, and been attended by a large number of scientific men from all parts of the Union. The following letter from Mr. Bond, to President Everett, of Harvard University, announces the resolution of the nebula of Orion:—"You will rejoice with me that the great nebula of Orion has yielded to the power of our incomparable telescope. This morning (September 22), the atmosphere being in a favourable condition at about three o'clock, the telescope was set upon the Trapezium, in the great nebula of Orion. Under a power of 200, the fifth star was immediatly conspicuous; but our attention was directly absorbed with the splendid revelations made in its immediate neighbourhood—this part of the nebula was resolved into bright points of light. The number of stars was too great to attempt counting them; many were, however, readily located and mapped. The double character of the brightest star in the Trapezium was readily recognised, with a power of 600. This is "Struve's sixth star," and certain of the stars composing the nebula were seen as double stars under the power. It should be borne in mind, that this nebula and that of Andromeda have been the last stronghold of the nebular theory: that is, of the ides first thrown out by the elder Herschel, of masses of nebulous matter in process of condensation into systems. The nebula in Orion yielded not to the unrivalled skill of both the Herschels, armed with their excellent reflectors. It even defied the power of Lord Rosse's 3 ft. mirrors, giving not the slightest trace of "resolvability," or separation into a number of single sparkling points. And even when, for the first time, Lord Rosse's grand reflector, of 6 ft. speculum, was directed to this object, "not the veriest trace of a star was to be seen." Subsequently his lordship communicated the result of his further examination of Orion as follows:—"I think I may safely say, that there can be little, if any, doubt as to the resolvability of the nebula. We could plainly see that all about the Trapezium is a mass of stars, the rest of the nebula also abounding in stars, and exhibiting the characteristics of resolvability strongly marked." This has hitherto been considered as the greatest effort of the largest reflecting telescope in the world, and this our own telescope has accomplished.—*U. States paper.*

SIR JAMES MURRAY'S FLUID MAGNESIA.—Prepared under the immediate care of the inventor, and established for upwards of 30 years.—This elegant preparation is recommended in all cases of bile, acidities, indigestion, gout, and gravel, as the most safe, easy, and effectual form in which magnesia may—and, indeed, the only one in which it ought—to be exhibited, possessing all the properties of the magnesia now in general use, without being liable, like it, to form dangerous concretions in the bowels, it effectually cures HEARTBURN without injuring the coats of the stomach, as soda, potass, and their carbonates are known to do; it prevents the food of infants turning sour; in all cases it acts as a pleasing aperient, and is peculiarly adapted to females. It has long been known that the most serious consequences have frequently resulted from the use of solid magnesia, which has been proved by Mr. Brande and many other eminent chemists, to form concretions in the bowels, endangering, and, in some instances, destroying life.—Sir HUMPHREY DAVY testified that this solution forms soluble combinations with uric acid salts in cases of gout and gravel—thereby counteracting their injurious tendency, when other alkalies, and even magnesia itself, had failed.

From Sir PHILIP CRAMPTON, Bart., Surgeon-General to the Army in Ireland:—"DEAR SIR,—There can be no doubt that magnesia may be administered more safely in the form of a concentrated solution than in substance; for this, and many other reasons, I am of opinion that the fluid magnesia is a *very valuable* addition to our Materia Medica.—PHILIP CRAMPTON."—Sir J. Clarke, Sir A. Cooper, Dr. Bright, and Messrs. Guthrie, and Herbert Mayo, of London, strongly recommend Murray's Fluid Magnesia, as being infinitely more safe and convenient than the solid, and free from the danger attending the constant use of *soda or potass*.

Letter from J. Murray, Esq., Lecturer on Chemistry, F.S.A., F.L.S.:—"DEAR SIR JAMES,—Many years have elapsed since you first showed me, in your laboratories, your super-carbonate, or soluble magnesia, and demonstrated experimentally the remarkable quantity of pure magnesia held in transparent solution. It was then new to me, as it was to the chemical world, and I speak advisedly, as a practical chemist. I believe its medical value cannot be too highly estimated; and I am satisfied that the public is under an infinite debt of gratitude to you for those invaluable researches, which have been the means of its introduction. Not to mention its more obvious healing virtues, I believe it to be almost, if not altogether, a specific for lithic acid concretions, when used in the pure condensed solution invented by you.

"Believe me to be your's, faithfully, JOHN MURRAY, F.S.A.

"To Sir James Murray, Dublin. Portland-place, Hull, Aug. 30, 1839."

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"To Sir J. Murray. Tuthill's Hotel, Dawson-street, Dublin, Feb. 19, 1839."

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## RAILWAY LEGISLATION—NEW RAILWAYS BILL.

The Railways Bill has been passed to the House of Lords, somewhat improved in its details, but in substance as we described it on its first appearance in Parliament. The benefit to be expected from it may, perhaps, consist as much at allaying certain anxieties, as in the direct use to be made of its provisions; in the meanwhile, it is well that Ministers have avoided the error of making it a coercive instrument, as some of their reckless advisers would have had them do. This part of the subject being now disposed of in the Commons, we may return to our survey of the more general scheme of regulation, suspended last summer, but which, if reports may be trusted, is to be revived, with certain alterations, in the present session.

We have already spoken of the objects included in that measure, that were at once the most important in their nature, and the fittest for administrative control. The exercise of a proper superintendence by the State over the general scheme and direction of great national works, clearly belongs to its province; and any questions that can be raised on this subject belong, as we have seen, firstly to the singularity of attending to it at the twelfth hour, when the main part of the work has already been done, without any guidance from authority whatever; and, secondly, to the description of persons to whom its direction may be entrusted hereafter—it being obvious, that whatever may yet remain, subject to control, had far better be left to such chance determination, as has hitherto prevailed, than be put into incompetent hands, or into hands that, however well qualified to act, are tied up from acting efficiently. The main outlines of the railway system, it has been observed, are now drawn beyond recall, as accident has determined; but if it be now thought necessary to take a stricter course with the mere remnants and fillings-up of the general scheme, there can be no doubt that it will be quite in accordance with the natural office of a Government to regulate these—the only proviso being, that the business shall be thoroughly transacted by men, who know what they are doing, and who are resolved to do it justly.

On the other principal class of objects intended by Mr. Strutt's late bill, a very different opinion may be entertained. The design of undertaking a so-called superintendence of working railways, in the manner proposed, cannot well be reconciled with any understanding that has hitherto prevailed in this country, as to the duties of the governing body, and is open to objection, not on this account only, but because the questionable nature and harrassing effects of the plan would not be redeemed by any real usefulness. On a discussion of this point, it is desirable not to linger amidst general phrases, but to come as directly as possible to the real substance of the proposal. It is very common and very easy for indolent, or dissatisfied, minds to turn, on every occasion, to the State, and say "the Government should watch over this, and appoint officers to prevent that and the other." A more considerate understanding will inquire, first, what is really wanted?—and then, with what certainty can the want be relieved by the means proposed? "The Government" is a well-sounding abstraction; but its operations are, after all, conducted by men like ourselves, who have no patent of infallibility, and are apt to be very strangely chosen. What reason is there to conclude, that an advantage will be gained, by trusting one set of men rather than another, if this be all that you can practically arrive at? These would be some of the questions occurring to a rational mind, in the first place, were an *effectual* transfer of the control under discussion.

An entire transfer of the management of railways to the State—if railway management, as it now exists, cannot be safely left to present laws, or to any future laws that may be justly enacted for their government—would, indeed, be a clear, and the only consistent, or promising, course. Taking for granted what has been said by the advocates for further coercion, that "private bodies ought not to be left in charge of our public roads"—admitting that the administration of them has been as bad as it has been notoriously the reverse—allowing that there is any practical case, which may be denied altogether, for desiring an organic change—this is the only change that can be safely adopted. If the necessity exists, as above stated, let all these roads be taken bodily out of the hands of their present managers: let them be wholly handed over to the State. Let some one party have the complete and exclusive charge of working them; without which they cannot be otherwise than ill worked.

It is true that the promise of such a change would not be very encouraging to those who, from the example of extant government establishments, must form some notion of what railways would become under the same kind of control. To cashier the present managers, and take shelter under official wings, in the expectation of finding greater care for public convenience, a readier adoption of improvements, more civility, despatch, and common sense, in the daily transaction of the business, will seem a strange notion to those who have had much practical knowledge of either. Still, if we must have the Government called in—if those who have made these works cannot be trusted to conduct them, under the strictest directions of the law—the plain and proper course is to take from them all power and all responsibility, and lay both wholly on the State. We shall then know with whom we have to deal—on whom the duties and liabilities of this business rest. We shall, also, know that the new authority is in a condition to manage it with some effect; and see where the merit of improvement, or the blame of deterioration, is to be imputed. We shall have no lame excuses for error, on the score of imperfect powers; and those who undertake the control will, as it is just, and, indeed, necessary that they should, bear the real burden of the work on their shoulders.

But this is nothing like what the Railway Commissioners proposed. Their plan was, to introduce a system of control without effectual responsibility; a shifting something like power, to be assumed when it may be convenient, and thrown off when the obligations attendant upon it are found onerous. The office of the State, on this plan, would be a nondescript, hovering between the duties of judge, informer, and constable—all these functions being, in turn, entrusted to one and the same body. The railway manager, the railway board, is nominally left in charge of all—is burdened with the responsibility for all; yet it is so arranged that they shall never feel their hands free for a moment—know that they have really the control of the establishment, which can only be kept in good order by commanding the most strict obedience—or foretell at what hour they may have to wait upon some Whitehall officer, empowered to examine the company's servants upon oath, rummage the books and papers, and hold up to their eyes a long list of frivolous delinquencies created by the bill, with heavy fines attached to them. Under such conditions, which it lay in the essence of Mr. Strutt's plan to introduce, could it be expected that any respectable man, much more any one of the better class, required for the office of manager or director, will be willing, nay, will able, to execute a difficult and anxious charge? Can it be believed that a method, calculated to produce disorder, discontent, and relaxation in duty of all kinds, and to drive every individual of spirit or character out of the offices exposed to such vexatious visitations, would be a means of improving railway management?

One effect it was certainly well calculated to produce. A numerous tribe of ministerial underlings and *protégés*, half-pay officers and election jobbers, hangers-on of influential peers—in short, the whole "tag-rag and bob-tail" of hungry waiters on men in place, would have had a new El Dorado opened to them, at the expense, be it remembered, of the unfortunate railways. To these agents, and to the dispensers of the patronage bestowed on them, the system would be highly pleasing, no doubt; but that the quartering on our railways of an army of this miscellaneous class, to take notes, and hold inquiries, and report formal omissions, would in any way promote the safety or order of the system itself, may be emphatically denied. The first serious objection to this array of inspectorship is, that it would most certainly be formed for the greater part of persons wholly unqualified for the superintendence of the experienced men who now direct our working lines. But it must further be asserted, that merely casual inspection, even if exercised by the fittest men in the universe—who will scarcely be found in the lists of Whitehall—could not lead to good, and might often enough do harm. There can be no divided control safely applied to a machine of this nature; and those only can properly control it who are daily, hourly—altogether, indeed, engaged in its operations. To these full power must be left—of course, under responsibility to law. Whatever impairs either—and you cannot weaken the one without laming the other—is merely so much taken from their efficiency; and, if much is taken, all efficiency is at an end. This subject will deserve to be noticed a little more closely, as it is of the utmost practical importance that it should be clearly understand in any discussion of new regulations.—*Daily News*.

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EXTENT AND COST OF RAILROADS IN THE UNITED STATES.—The newspapers are publishing a table of the railroads of the United States, stating their extent at 5076 miles, and their cost about $123,000,000. The table is very imperfect, and fails to present the whole truth on the subject. More satisfactory statistics may be found in the *American Almanac* for 1848. By a careful examination of these, we arrive at the following results:—January, 1846, there was in New England 1074 miles of railroad, constructed at an average cost per mile of $38,609 18½ c., or a total cost of $39,226,922 33 c., the first roads being completed in 1835. In 1846 and 1847, 34 more roads were chartered by the Massachusetts Legislature, which will probably cost $12,500,000. In New York, at the same time, the aggregate length of railroads completed was 758 miles; cost per mile, $23,054 16 c.; total cost, $17,475,059. The total length of railroad completed out of New England and New York, was 3870½ miles. The table in the *Almanac* does not contain returns of the cost in every case. The average rate per mile, where returns are made, is nearly $25,000. This, we suppose a fair average for all. The result will then be—miles of road, 3870½; cost per mile, $25,000; total cost, $96,762,500. Nearly all these roads have been completed within the last 12 years. Here then is a summary:—Railroads in the United States, 5708½ miles; cost of construction, $158,464,475. If we take into calculation the railroads now in process of construction, and those that will be put under contract between this and 1850, we may estimate that, by that year, the enormous sum of $200,000,000 will have been invested in railroads, in a period not much exceeding 15 years! The investment is generally a profitable one. The average dividend on all the New England railroads, in 1846, was 7 per cent.—*Washington Era*.

## THE PATENT FUEL COMPANY.

TO THE EDITOR OF THE WEST KENT GUARDIAN.

SIR,—I notice in your paper of the 11th inst. a report of the adjourned meeting of the Diamond Steam-Packet Company, in which sundry charges are made against the Patent Fuel Company, for supplying the Diamond Steam-Packet Company with bad fuel, as also with short weight to some considerable extent per *Flying Fish*, and throughout the whole of this report the title of the Patent Fuel Company is used. I am, therefore, directed to request you to state in your next paper, that the Patent Fuel Company have never had any connection with the Diamond Steam-Packet Company, nor have they any wharf at Gravesend, nor are Messrs. Elkins, Fletcher, and Rackstow, their agents. I have had occasion to correct in your paper a similar erroneous report as to the company supplying the fuel used by the Diamond Steam-Packet Company, about 12 months ago, when it appeared that the fuel referred to was supplied by Wylam's Steam Fuel Company, of Newcastle and Great St. Helen's, London. This possibly may be the case now. As some injurious reports have reached me (even this day) in reference to the fuel used on board the South-Eastern Steam-Packet Company's steamers to and from Ostend and Boulogne, I take this opportunity of publicly stating that that also is not the Patent Fuel Company's fuel.

I shall take it as a favour if you will in any future report be more particular in designating the title of the company you may refer to, and this becomes the more necessary in consequence of the great injury such reports left uncontradicted might do to the large contracts this company have for their fuel with the Lords of the Admiralty, the Peninsular and Oriental Steam Navigation Company, and other parties. I am, Sir, your most obedient servant,

15, *St. Mary Axe, Dec.* 18. WM. NICHOLAS DE MATTOS, Sec.

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SUBMERGED STEAM PROPELLER—(*From a Correspondent*).—This improvement in the method of propelling steam-boats, is a clever, scientific invention, by Mr. T. B. Simpson. The invention has been tested in several experimental trips on the river, in a small steamer called the *Albion*. The submerged propellers are fitted to the little vessel, though she is not a craft adapted to test the full value of the invention—being far from handy, and extremely crank; she is disproportioned, both as respects her extreme length and want of breadth of beam; and the singularity of her appearance is heightened by the absence of paddle-boxes, and the invisibility of any machinery, or propelling apparatus, to force her through the water. So far, she looks like a screw propeller; her paddles are fixed in the sides of the vessel, and are situated beneath the water line. Her place of starting is generally the Brunswick Wharf, Blackwall; and many curious spectators are congregated to witness her departure, doubtless with the expectation of detecting, when her engine was in action, the mystery of her motive power. In this expectation, they are destined to be disappointed; for the mystery remained even after she is seen to depart, and still continues a mystery, from the peculiar construction of the vessel and her machinery. The submerged propellers consist of wheels, acting horizontally or vertically, in a case, entirely underneath the water. Those used in the *Albion* are constructed of four plain leaves, or floats, fixed on a vertical shaft, surrounded by the case; this case is a concentric circle, rendered eccentric by its position, with relation to the wheel, which it exceeds in size, sufficiently to give effect to centrifugal action of the water. The three problems of the most effective method of supply, the delivery, and, above all, of the best direction of the course of the water, appear to have been solved with great ingenuity by the patentee. The principle of the invention may indeed more briefly be stated to consist in the ejectment of a column of water in a parallel line with that of the vessel's motion, which column acts against the water outside the vessel. The patentee's theory is, that, as a swan swims onward, the columns of water, beaten back by the feet, act as powerful propellers, by beating back the dense mass of water with invisible, but irresistible, force. Nothing can be more beautiful than the noiseless and mysterious motion of Mr. Simpson's boat. There is an entire absence of all surface swell, and the vessel steals rapidly through the water as if propelled by some magical power. By a beautiful contrivance, the case is constructed so as to change its position on the wheel—being reversed when it assumes the same form as going a-head—and the wheel and case perform the same office as before, with the greatest precision. The diameter of the submerged propeller wheels of the *Albion* is only 24 inches; and the wheels necessary to be used in a boat of 300 or 400 tons burden, would not exceed 80 inches in diameter. This is one of the most extraordinary features of the invention—the diameter of paddle-wheels employed in steam-boats of similar tonnage being now nearly as many feet. The adaptation of this method of propulsion to canal-boats and narrow rivers, is a desideratum long wished for. The invention is one which cannot fail to attract the attention of the scientific world; and the uninterrupted course of experiments, conducted with indefatigable perseverance by the patentee, leaves nothing further required to ensure success.

RAILWAYS.—A "continuation" return, moved for by Mr. Mollatt, M.P., shows that the gross total length of all the lines of railroad for which Acts were passed last session (1847), amounts to 1353 miles; the gross total amount of capital stock to 25,686,257*l.*; the amount of capital actually subscribed to 11,702,951*l.*; and the gross total sums of money, which the companies are empowered to borrow, to 13,764,871*l.* So that, adding the amount of capital authorised to be borrowed to the original capital stock, it would appear that it was proposed to appropriate the enormous sum of 39,460,228*l.*, or nearly 40,000,000*l.* sterling, to the construction of new lines of railroad!

ABERDEEN RAILWAY.—Mr. Cubitt reports that—"The works of every contract are in progress, and, in the whole distance from Friockheim to Aberdeen, there is not a single unsound or improper piece of work. The numerous bridges and viaducts are all well founded, and certainly well built, and show no signs of settlement or failure, although many of them are very large and important—amongst which," he continues, "I would take as a specimen the viaduct at Fetteresso, on the Carron contract, near Stonehaven, which is completed, and carrying a heavy traffic of earth and stone waggons, for the completion of the embankment beyond it, and there are several other viaducts of the same kind in various states of forwardness, consisting of from 3 to 13 arches, varying from 30 to upwards of 70 feet in height, all equally good; as are also the few iron and many stone bridges on the line. In short, I do not know that I can express my opinion stronger than by assuring the board that, as far as I can see, I should have no objection in risking my own credit as an engineer upon all or any of the works I have seen in progress from one end to the other of the line."

CALEDONIAN RAILWAY.—The opening of this important railway, as a through line of communication between London and Edinburgh, may now be announced as an event on the eve of consummation, in proof of which we may state that, on Friday last, Mr. Addison, the resident engineer of the company at Carlisle, accompanied by Mr. Mould, chief agent of Messrs. Stephenson and Co., the contractors, and a party of their friends, performed the journey between Carlisle and Edinburgh in one of the London and North Western Company's first-class carriages. The only interruption experienced proceeded from the workmen on the line, who had assembled at various points to "cheer them on their way," which they did in good style. The line to Glasgow has been completed for some time, so that nothing now remains but minor arrangements to enable the directors to open this great line to the public.

PARIS AND LYONS RAILWAY—STATE OF THE WORKS.—We intended to publish a complete account of the state of the Paris and Lyons works; but, for want of room, we are compelled to postpone to our next number the interesting details we have procured. We shall, therefore, confine ourselves today to mentioning the principal facts, the communication of which to the public ought not to be delayed. We shall begin by announcing that the section from Dijon to Chalon has been received by the company from the Government's engineers, and that, according to every probability, that portion of the line will be opened about June next. The foundations of the Paris terminus are almost wholly finished. The works have advanced so much on the remainder of the line, that, as would appear, if they stimulate the zeal of their contractors, and pecuniary means be not wanting, the company must be enabled to open the line from Paris to Tonnerre in September. All their efforts may, therefore, be soon concentrated on the part that separates Tonnerre from Dijon, in order to connect, as promptly as possible, the three sections dividing the road between Paris and Chalon-sur-Saone. The tunnel of Blaizy is wholly bored through; the archway is almost finished, and the ground is lowered nearly to the level of the future road—all the wells are opened. With such a favourable state of things before us, we shall insist on the absolute necessity of leaving no section between Paris and Marseilles unfinished, not in one part more than in another. Yet, the works between Chalon and Lyons are not commenced, and the company will, no doubt, be stopped in that part by the exhaustion of their capital. In such a situation, we believe, we may predict that the support of the public and Government will not be wanting to the company; we need no better proof of it than the concessions already obtained last year, owing to the fair appreciation of the company's just claims, and the immense public interest involved in the prompt completion of the Paris and Marseilles line.—*Journal des Chemins de Fer* of the 18th inst.

A BANKRUPT RAILWAY CONTRACTOR.—At the Court of Bankruptcy, on Thursday, Thomas Burton, a railway contractor, of Commercial-road, Lambeth, was examined. The bankrupt had, it was understood, at the present time, a contract with the London and Birmingham Railway Company, to prepare 20 miles of rail, at a cost of about 170,000*l.* There were upwards of 300 creditors, whose debts amounted to about 60,000*l.* A short time since, the bankrupt proposed to pay them 20*s.* in the pound, and interest, within 12 months; but certain creditors refused to accept the proposition, and hence the present bankruptcy. After some discussion, assignees were chosen.

THE PRE-EMINENCE OF HOLLOWAY'S PILLS, FOR THE CURE OF BAD DIGESTION AND LIVER AND STOMACH COMPLAINTS.—The superiority of Holloway's pills, as a safe and effectual remedy in all cases where the stomach is deranged—the digestion impaired, or the liver diseased—is universally acknowledged by all classes of society throughout the civilised world. For the cure of those complaints, they surpass every other medicine hitherto discovered: they act so directly upon the disease, that sufferers need only to give them a trial to be convinced of their efficacy, particularly those persons who have had their maladies aggravated by a long residence in India.—Sold by all druggists, and at Professor Holloway's establishment, 244, Strand, London.

# Transactions of Scientific Bodies.

*MEETINGS DURING THE ENSUING WEEK.*

MONDAY.....Geographical—3, Waterloo-place ..... 8½ P.M.
TUESDAY.....Zoological—11, Hanover-square..... 9 P.M.

## On Mining, & the Practical Applications of Geological Science.

PROF. ANSTED'S LECTURES, AT KING'S COLLEGE.

LECTURE XI.—THE PRACTICAL APPLICATION OF GEOLOGICAL SCIENCE TO MINING—THE NEWCASTLE COAL MINES—*(Continued.)*

Professor ANSTED said, that the topics on which he should treat in that day's lecture, would be confined exclusively to the phenomena connected with those accumulations of gas in coal mines which caused explosions; and he selected this opportunity, partly because the subject arose naturally out of that of ventilation in coal mines, being also itself a distinct subject of the greatest possible importance, and also because public attention had been called to it, by the frequency of explosions and the great loss of life which often accompanied them. The application of means to prevent these direful accidents was a subject of the greatest importance, as regarded the internal economy of the mine; and he should, therefore, have to consider the circumstances under which accidents of this kind might be expected to take place; and if, on examination, they seemed to be unavoidable, the possibility of so managing the mines as to involve, at any rate, a less fearful destruction of human life. This was a subject which had many times attracted the attention of the public, and of various scientific bodies. He (Professor Ansted) had had the honour of stating the result of his inquiries at the meeting of the British Association for the Advancement of Science, held at Cambridge, in 1846, and the heads of what he had then said was published in the reports of that body, and were also printed at the time in the *Mining Journal*. He mentioned this circumstance because, in those reports, certain methods of prevention were suggested, which, he continued to think, would, if carried into execution, have been of great service in some cases which had occurred more recently.

The danger of explosions in coal mines arose, no doubt, from issues of gas proceeding from the coal itself. He had already had occasion to mention more than once the fact that gas was constantly given out by coal; not only when exposed to heat, or unusual compression, but also under ordinary atmospheric conditions. When any one went into a coal mine for the first time, they would probably notice a peculiar singing noise, which, though it was not easy to understand, there was no doubt arose from the issue of gas from the coal. It was not known with certainty, whether this arose from the bursting of certain small vesicles in the coal; or whether, in consequence of the pressure of the gas on the successive films of which the coal was made up, the singing noise resulted from the gas coming out, as it were, in the form of a thin plate. Certain it was, that in coal mines, there was this unusual noise, and that it was connected in some way or other with the presence of gas. This noise was heard unceasingly in mines of certain kinds of coal, and in every such case, therefore, measures must be taken with regard to its results. The quantity of gas thus produced, varied, however, very much, according to the nature of the coal and the amount of atmospheric pressure, which appeared to be the two principal causes which regulated the issue of gas from the fractured surface of the coal. In order to give some idea of the quantity of gas sometimes given out, he might mention, that in the Benaham seam, which was known to be a particularly fiery one, gas was thrown out so rapidly, and in such purity, that, by boring a little hole in the mineral, and applying a light, a jet of flame would be produced. In this case, the gas would be in too pure a condition to be explosive, because, to make it so, a certain admixture of atmospheric air was necessary. The quantity of gas thus given out naturally "by singing," from four acres of coal, was ascertained, some time ago, to amount to 10,000 hogsheads per minute. Seams of coal, however, varied very much in this respect, and some contained scarcely any gas at all. Besides this constant issue by singing, there was another way in which the gas was met with—namely, in what were called "blowers:" these were puffs of gas, sometimes taking place at long cracks, or at faults, and at others at mere holes; they were sometimes very common, and produced as much gas as served to light certain parts of the mine—as, for instance, the principal passages; and this, indeed, was the safest possible way of getting rid of it. In the Killingworth Mine there was a "blower," which had been burning for some years. In other instances, a fault was touched, which gave out gas, and when the same fault had again been pierced, it had produced no gas. Sometimes, as in the case of the Great Jarrow explosion, when the works approached near a fault, the pressure of the gas pent up in it had forced forward the coal, which divided it from the mine, and involved all the workmen in certain destruction. These were all very difficult circumstances to deal with, as it was impossible to anticipate them. Besides these blowers, which occurred in the natural state of the coal, there were constantly dangerous accumulations in portions of the mines which had been worked out, or partially worked, and in which the roof had partly fallen down. It was impossible to prevent these accumulations where the roof had fallen, and in old workings; and they were always, more or less, dangerous, because the gas was here inevitably mixed with atmospheric air, and generally in such proportions as to be highly explosive: they were also not uncommon in faulted districts—where the beds were in a broken state, the result of contraction, or pressure, at some remote period. In all these cases, accumulations of gas took place, and the gas was liable to burst forth on the smallest atmospheric change. If, for instance, a fall in the barometer indicated that the pressure of the atmosphere had become less, its existence would not be so great, and a quantity of compressed gas would be forced out by expansion. Gas being thus present in the mines, either in the body of the coal itself, or in accumulated quantities, the danger arose from the fact, that it was impossible to conduct mining operations underground without lights. The most convenient way of lighting, according to the miners, was by candles; and this, partly, because they were easy to carry about, and partly from long custom. There was a great prejudice in favour of candles, which they always would use wherever it was possible. Now, it must be remembered, that generally part of the mine only was liable to the ordinary issues of gas, while other parts were subject to what might be called extraordinary issues, such as arose from unexpected accumulations. In the former case, the use of open lights would be perfectly safe, provided the general ventilation were tolerably good. Thus, it might be considered, that, under ordinary circumstances, such parts of the mine would be safe, and the other parts dangerous; and it was generally found, that if the workmen were allowed to use candles in the safe parts, they did not object to use lamps in the dangerous portions. But the condition of any district was always liable to be disturbed by new blowers commencing, or by the influx of gas from the dangerous districts; and, therefore, a vigilant superintendence of the state of the mine was indispensable. It was also necessary, if anything was to be done in the dangerous parts of the mine, that light should be obtained by safer means than by candles, because the smallest contact of flame was sufficient to explode certain mixtures of carburetted hydrogen gas and the atmospheric air. The explosive admixture was a mechanical one, and it was necessary to understand precisely of what proportions it was formed. If the gas came out pure, and a candle was thrust into it, the flame would be extinguished, because there was nothing to support combustion; but the gas itself would take fire. If there were three parts of atmospheric air and one of gas, the mixture would be incapable of supporting combustion; but when it was composed of five parts of air and one of gas, it began to be faintly explosive; and, when once explosive, it would set fire to other gas, which was too pure to explode. When the gas was as 1 to 6, it became very explosive, and continued so until the proportions were 1 in 10, when it began to be less explosive. The danger, however, was not destroyed until the mixture became weaker than 1 part of gas to 14 of air; after that it merely enlarged the flame of any light which might be brought into it, and turned it blue. The miner was thus enabled, by the lengthening of the flame of his light, and its appearance, to tell whether he was in a dangerous part of the mine, and the amount of gas that might be present in the atmosphere. If the flame reached to a certain height, the practical miner could tell at once how nearly the atmosphere approached an explosive combination, and with some other similar points affecting his safety, and that of his fellow workmen, long habit had made him familiar.

There were several considerations of importance connected with these explosive admixtures of gas and air; as, for instance, the effect produced by the breathing of a number of men, which very much lessened the danger, by altering the proportions of nitrogen and oxygen in the atmosphere; and thus one portion of the mine would be less explosive than another, though both might contain the same proportion of carburetted hydrogen.

Every part of the mine which was capable of being worked, should, in all cases, be visited with guarded lights, before other lights were allowed to be taken; and the state of the mine should always be well ascertained before open lights were used. There was also a certain amount of danger in going into some portions of a fiery mine; and, until within the last 30 years, the only means of obtaining any degree of light in such cases, was by the use of an apparatus called "the steel mill." This was a very ingenious contrivance, by which a stream of sparks was produced by pressing a flint against a revolving plate of steel; and this afforded sufficient light to move about, but not enough to work by. It was, moreover, a dangerous contrivance—for, every now and then, there could be no doubt, a flame was produced, sufficient to explode gas under certain circumstances, and particularly if olefiant gas should be present, which, however, did not appear often to be the case in English mines.

About 30 years ago, a great number of serious accidents occurred in the mines of the north of England, following each other in alarmingly rapid succession. Very many lives were lost, and the public attention was much directed to the question whether, or not some improvement could not be discovered in the way of lighting the mines. Sir Humphrey Davy, then in the zenith of his reputation, was applied to by Mr. Buddle, a well-known colliery viewer of that day, and invited to turn his attention to the subject. Humboldt had before attempted to overcome this difficulty; but his contrivance was only partially useful for visiting dangerous mines, as it would not burn longer than half an hour, the flame being supported by a reservoir of atmospheric air within the lamp. Dr. Clanny improved this lamp, admitting the external air freely in cases when it was used in an explosive mixture; but this lamp was practically useless, as the explosions which took place inside it soon put out the light.

The learned lecturer then proceeded to explain Sir H. Davy's invention, illustrating it by various diagrams, and by a "Davy-lamp." Its principle was founded upon the discovery, that the explosion of the mixture in question did not pass through small tubes; and after numerous experiments, Sir Humphrey Davy found, that the length of the tubes was of no consequence, but that wire gauze, the apertures being of the proper dimensions, answered the same purpose. By this means, all necessity for an exterior glass was got rid of, and the new lamp might be carried into the most explosive admixtures without danger. Such was the Davy lamp; and he believed that, as it was the first, it was by far the best, real safety lamp that had been invented. It was, perhaps, not perfect, judging only by experiment; but it was decidedly the best for all practical purposes, as it was more manageable than any other, and not so easily put out of order. The gauze usually employed was made of iron wire, and had 784 holes to the square inch. Sir H. Davy, having perfected his lamp, went down to the Newcastle coal field, and, with Mr. Buddle, traversed with impunity some of the most dangerous parts of the Benaham seam, at that time the most fiery known. The Davy lamp had been used with great success ever since; and, though some accidents had occurred under circumstances in which no lights, but those of Davy lamps, were present—it was as safe as any such instrument could be. The superiority of this lamp over more recent inventions consisted in its producing a greater quantity of light, and being more portable, with at least as much safety. Mr. George Stephenson, the engineer, had also invented a lamp, which was called a "Geordie," after the name of the inventor. It was, however, merely a modification of the Davy lamp, by the addition of a glass tube, which answered the double purpose of increasing the light, and keeping the flame steady, by shielding it from currents of air. This, perhaps, gave it additional safety while perfect, as it was possible to drive an explosion of common street gas through the gauze of a Davy lamp. The glass, however, was liable to be broken, and then the instrument became a large and somewhat dangerous "Davy." In some of the Belgian mines a lamp, called "the Muesseler lamp," was in use, but it was a very complicated affair, and for that reason was inferior to Sir H. Davy's invention. No doubt, it was safer theoretically, as by it the flame was extinguished the moment the lamp was taken into a dangerous atmosphere; but this very much lessened its utility, the main point being that the lamp shall give light with safety under such circumstances. The Davy lamp, with care, might be taken anywhere. He (the lecturer) had himself been in every description of atmosphere, and he had often seen explosions take place inside the Davy lamp by which he was lighted. This, indeed, was a circumstance which happened constantly to every viewer, over-man, and Davy-man in the Newcastle coal field. The true danger of the Davy lamp was one that would apply equally to any other, and it arose from the fact, that its constant use made the workmen careless, and the more it was used, therefore, the greater chance was there of accidents. The learned lecturer here exhibited a printed placard, setting forth the regulations which were adopted in the Wall's End Colliery in respect to Davy lamps, the most important being that which enacted that no man should be allowed to use his Davy lamp until it had been examined carefully by the Davy-man, and pronounced perfectly clean and in good order, nor until it was securely locked, so that the workman could not take it to pieces, and expose the flame in an unguarded manner.

With regard to actual accidents, the professor remarked that he should not say much beyond placing before them the circumstances of a few of the most disastrous, which would serve to explain the nature of the results of the explosions of which he had explained the cause. The most important, then, that he should mention, occurred in the Haswell Colliery, on the 28th September, 1844, when 95 lives were lost; and the next was that at the Jarrow Pit, on the 3d of August, 1845, when 41 persons were killed. In the same year, 35 lives were lost at Killingworth; and in 1846, 19 at Oldbary and 36 at Risca. By these accidents occurring within a period of little more than two years, upwards of 200 persons lost their lives; and he had grouped these accidents together, in order to give an idea of the extent to which they occurred. There were, then, 200 lives lost in two years in working coal mines from accidents, which, in the opinions of the juries who held inquests on the unfortunate sufferers, could not possibly have been prevented—the mines being in every case, except, perhaps, in that of the least considerable, in good condition at the time.

In the first of these accidents, that of the Haswell Colliery, there were underground at the time of the accident 99 persons, of whom four only escaped. It was an important consideration (which also applied to other accidents), whether it was absolutely unavoidable, the catastrophe having occurred, that all these people should be killed. It might be that the whole matter was beyond human control, as in the case of a shipwreck. If we crossed the sea, the vessel, being made by human hands, was liable to accidents which might happen from stress of weather, which no one could help; or by carelessness, in respect of which some one would be culpable. If everything were done to render the vessel seaworthy, there would be no blame attaching in respect to its condition, though the vessel should be wrecked in a storm; but, if the vessel were sent to sea in an unsafe condition, there was blame. Just so was it with regard to mines: if the mine were in as good a condition as science, and the adoption of the best plans, could make it, no blame might be attributable to any one for an unforeseen accident. But, if it were possible so to manage the mine as to lessen the chances of accident—(he did not believe accidents could be entirely prevented); and if that were not done, then there would be blame. The sea must be crossed, despite of shipwrecks; and coal must be had, let it cost what it might; the point was to get it under the most favourable circumstances. In the case of each accident, therefore, it was important to consider whether everything was done by way of prevention and palliation which could be done. In the case before them, that of the Haswell Colliery, the accident occurred in a part of the mine where the pillars had been removed and the workmen were taking away the props. This was always a delicate operation, because the props being removed, the roof fell, and the accumulations of gas were disturbed, and often shifted. Before proceeding further with the particulars of this melancholy accident, it would be necessary to mention the effects of an explosion upon the atmosphere. The carburetted hydrogen when exploded became decomposed; the oxygen in the atmosphere mixed with the hydrogen and formed water, and nothing was left to breathe but pure carbonic acid gas. This was a most poisonous gas, and produced instant death by choking. At least, insensibility was instantaneous; and, although in such cases, when measures were taken almost immediately, recovery had taken place, death was generally inevitable. The result of an explosion, therefore, was to turn the atmosphere into pure carbonic acid gas; and every man in that district of the mine, in which the accident occurred, was doomed to certain death. The Haswell Mine was divided into three great divisions, or three pannel workings; the explosion took place in the middle division, and 30 or 40 persons, far removed from the scene of the accident, in another pannel, were poisoned by the after-damp. This could not have occurred had the ventilation of each pannel been as distinct as it might have been; and—he was, therefore, bound to say—as it ought to have been. The explosion at the Jarrow Pit, in August, 1845, by which 41 persons were killed, was another instance where such a large destruction of human life was occasioned by the absence of two shafts; for the means of ventilation at the only one being destroyed by the accident, there was no means of restoring it previously to the mischief being done. Another interesting case occurred in the Killingworth Colliery in 1845, which was the result of a fault. On one side of the district there was a long stone drift, at right angles to the main rolley-way of the pannel, in which the men were working; a fault was reached, and this gallery not prosecuted beyond it. The chief object was to drive through a mass of coal in order to get the ventilation completed, and for this purpose they were at work day and night. The fault was pricked in the course of the work in a succession of places, up to two or three days before the accident (which took place on a Thursday), without any unusual presence of gas being observed. On the Wednesday the fault was once more pricked, and no gas came out. On Thursday, one set of men had performed their allotted portion of work, and about two hours afterwards another gang of workmen descended; and it is singular that, though the gallery was considered so far dangerous that the men were working with Davy lamps, a boy was allowed to precede them with an open candle—a piece of carelessness most inexcusable, and for which they paid with their lives; before they reached the spot where the workings were, an explosion took place, and every person in the mine perished. Some idea of the force of these explosions might be deduced from the fact that, on this occasion, a stopping consisting of 36 ft. of rough materials, with an inch and a half brick wall on either side, was blown to pieces. In another instance, at the Jarrow Mine, an accident happened, and on examining the mine afterwards, a cavity was found, in which there had been probably about 200 cubic feet of gas in a very condensed state, and the side of the cavity being reduced by the working, it had given way, and let out the whole, which exploded with irresistible force. This was a kind of accident to which the miners were constantly liable, and which no vigilance could foresee or prevent. Accidents, and all their particulars, ought always to be recorded, and they could not be discussed too much. It was quite clear that, although it was impossible to avoid accidents, the risk was greatly diminished by good and effective systems of ventilation, and by unceasing care in the use of lights.

[The succeeding lecture, which contains a description of the other coal fields of England, and those of Wales, will appear in our next week's Journal.]

## GEOLOGICAL SOCIETY.

DEC. 15.—Sir H. T. DE LA BECHE (President) in the chair.

J. North, Esq., and T. F. Gibson, Esq., were elected fellows.

A paper "On the Mineral Character and Fossil Conchology of the Great Oolite, in the neighbourhood of Minchinhampton," by J. Lycett, Esq., was read.—A letter from Col. Mackintosh to J. C. Moore, Esq., was read, relative to the depression of the land on the shore of the Bay of Naples. At the Hospice of the Capuchins, between Naples and Puzzuoli, the water is now so high as frequently to cover the floor of the building. On the side next the sea, there was formerly a vineyard, but the whole is now covered with water, and an old monk has frequently eaten grapes which grew on the spot where boats are now sailing. "A Description of a new Species of Nautilus (*Nautilus Saxbii*), from the Lower Greensand of the Isle of Wight," by J. Morris, Esq.; and an "Account of the Recent Landslip at the Lizard Point, on the 19th of Feb., 1847," by C. A. Johns, Esq., were read.

## SOCIETY OF ARTS.

Dec. 23.—BENJAMIN ROTCH, Esq. (vice-president, in rotation), in the chair.

After the usual routine of business had been gone through, Mr. SMITH WILLIAMS, after a few introductory remarks, stated that the discovery of the art of lithography was, like that of many others, purely a work of chance; it had been found out, when quite a different end had been in view. About 1795—the exact period was not known—Alois Senefelder, the son of an actor at Munich, and also an aspirant for histrionic fame, made the discovery alluded to. He was in the habit of printing the speeches which he had to study, and as copper plates were too dear, he tried tin ones: these were found to be uncertain in their action, and he had recourse to stone—a peculiar kind of stone, known now as lithographic stone, was obtained by him: this stone was remarkably porous, and he was enabled by its means to engrave his speeches easily, and to draw the letters backwards. In this state, however, he might have remained, had not chance directed it otherwise; having one day been desired by his mother to make a note of a certain household bill, and not having any pens, ink, or paper, he determined on drawing it on the stone. This was done, and the writing allowed to remain some time. It then struck Senefelder, if he bit away the stone round the writing with acid, he might be enabled to produce an engraving. The acid was applied, and thus the discovery was made. The art of lithography, Mr. Williams said, was one which required the utmost care and taste; the touches on the stone must be made at once, from the circumstance that no retouching would serve to improve that which was once done wrong. That there were four methods of lithographing—by means of chalk or grease in a hardened state, ink or grease in a liquid state, engraving with incised lines, and those lines being filled up with ink, and by transferring drawings on prepared paper to the surface of the stone. Great care was required to be taken, that the outline of the drawing should be neat and cleanly executed, and that it was properly bitten by the acid; for were it bitten in too deep, the shades would turn out black and patchy; and were it not sufficiently bitten in, the lights would be faint and imperfect. The art of lithography was an ally to engraving—not a rival, and as such it was now regarded by English artists; and, on that account, we were fast approaching a state of the highest perfection in it.—Mr. Williams was very warmly applauded frequently throughout his reading of the communication. The walls of the room were thickly hung with most beautiful specimens of lithography.

ELECTRIC TELEGRAPH IN HOLLAND.—A recent ordonnance of the King of Holland enacts, that no line of electric telegraph shall be established without the consent of the Government; that the tariff for the transmission of intelligence shall be submitted to the Ministers of the Interior and Finance; that intelligence from, or to, the Government shall be transmitted in preference to that of private individuals; that, in time of war, the telegraph shall be placed under the control of the Navy and War Departments; that when peculiar circumstances shall require it, the service of telegraphs shall be provisionally or entirely suspended; that all the news received or sent by the telegraphs shall be inscribed on registers; and that, if eventually the use of electric telegraphs shall be found to lessen the revenues of the Post-office, the proprietors of the telegraphs shall be obliged to pay an indemnity.

CHARGE OF DISCLOSING TELEGRAPHIC EXPRESSES AT NEWCASTLE.—On Monday week, a summons was granted at the Newcastle-on-Tyne police-court, against Mr. Thomas F. Dickenson, a stock and share broker, to obtain his attendance before the magistrates to answer a charge of conspiracy against the Electric Telegraph Company, he (Mr. Dickenson) having, by means of promises of bribes, which the clerks had agreed to accept, obtained from them the prices of shares, when it was the duty of the clerks to have expressed the same on to Edinburgh, and not to have communicated them to any person in Newcastle. Mr. Chater, a solicitor, stated the particulars of the case at great length, and examined the clerks in question, who admitted that they had agreed to translate the price of Consols, &c., for Mr. Dickenson, as they were passing them on to Edinburgh, for the sum of 1*l.* per day, or more, as the speculations of Mr. Dickenson might prove successful. The clerks stated that they did not consider their written instructions on this head to be so sufficiently specific as to prohibit their doing what they had done; and one of them said, in palliation, that their salaries being only a guinea each per week, was hardly sufficient to keep them. The magistrates recommended an indictment at the sessions, but Mr. Chater having urged them to grant a summons in the first instance, in order that the company might be better able to determine on the course they ought ultimately to pursue, the summons was according issued. Mr. Chater observed, that it was not the wish of the company to adopt harsh measures, but they must be protected in the enjoyment of their patent, and not be defrauded with impunity.—*Carlisle Journal.*

## THE COST-BOOK SYSTEM.

VICE-CHANCELLOR'S COURT, BEFORE SIR J. WIGRAM, DEC. 20.

CURLING *v.* FLIGHT.—This was a bill for specific performance of a contract to purchase certain shares in mines in Cornwall and Wales, which the particulars described as shares in mines. The Master reported a good title shown, and the defendant (the purchaser) excepted to that report. The case was argued during last term, and his Honour now delivered judgment:—

The bill alleges that, by a certain custom, well-known in mining districts, the names of the owners of shares in mines are registered in a book kept by the company, and called the cost-book; that, in buying and selling shares, no other evidence of the vendor's title was required, as between him and the purchaser, except the acknowledgment of the vendor's title as such owner in the cost-book. The bill prayed a specific performance of the agreement upon that principle. The defendant (the purchaser), by his answer, insisted that he was entitled to have the title to the shares made out in the usual way. Upon motion, the usual reference as to the title was directed to the Master, there being no suggestion as to the ambiguity or equivocation in the terms of the contract, or the subject-matter thereof. Before the Master the vendor insisted that he was not bound to give any evidence of title, except the production of the cost-book; and to show therein the assignments which had been made to D. Curling (his testator), which entitled him to have his name put on the cost-book, which assignment was, in fact, nothing more than an entry in the cost-book; and that such entry was lawfully made. The Master reported a good title shown. The defendant took exceptions to that report. The evidence appears to me to show, that as between the different adventurers in the mines—all of whose names were, or ought to be, registered in the cost-book—the entries of such names in the cost-book were sufficient *primâ facie* evidence of the rights of the parties as between themselves; but as between those parties and strangers who might possibly claim adversely to the adventurers, the cost-book was not evidence for any purpose whatsoever. The question, therefore, which the exception raises, is, whether the defendant was bound to accept a title, which, at the utmost, only showed that he was entitled to certain shares as between himself and the present adventurers in the mines, but which left untouched the question whether the plaintiff and the other adventurers in the mines had any title to the mine itself, of which he had contracted to sell certain shares. If the terms of the agreement merely imported that the vendor was to retire from the adventure, and give up to the defendant the place which he might have occupied in the cost-book, as the holder of the shares, that might possibly entitle the plaintiff to what he seeks by his bill. But, if according to the true import of the contract, the vendor contracted to sell shares in a mining adventure, I cannot see upon what principle the court is asked to decide that the vendor is not bound to tell the purchaser what was his interest in the mine, the shares of which he was entitled to sell. The argument might be carried to this length—that the purchaser had no right to inquire whether the interest in the joint-adventure was freehold or leasehold, or was worked by license or by trespass; or what, if any, was the title which the adventurers might have acquired by such trespass or otherwise. Suppose the vendor had in the particulars of sale stated that he acquired by purchase a title to all the shares in the mine, and had offered to sell all the shares—that is, in effect, the mine itself—could the court admit the proposition that the vendor had nothing to do, on the question of title, but to show his own name lawfully inscribed in the cost-book, showing, as between himself and the former shareholders, he was sole owner of the mine? If the argument of the vendor were well founded, the purchaser might pay his money to-day, and be evicted to-morrow, without having any cause of complaint. I do not say that such a contract might not be made; but it is not the contract in this case. According to the particulars, shares in a mine, and not such interests as the plaintiff might have, were the subject of sale. It was said, however, that unfortunate consequences, or, at all events, an argument leading to absurdity, might follow from such a decision; that if the court once holds that the cost-book is not conclusive evidence on the question of title, it would be to decide that the vendor of a share on a going partnership would be bound to make out a marketable title to every article constituting the partnership assets. To show the absurdity of such a conclusion, it was said that if a partner in a brewery, with the consent of his copartners, were to sell his share *eo nomine* to a third person, the purchaser might require that a marketable title should be shown to every part of the partnership premises, including every public-house, the stock of the firm. I mean to decide no such point. The title which a purchaser may require must vary with the subject-matter, and the terms of the contract. The partners in a brewery might very well agree among themselves to purchase, as part of their stock, property, the title to which was known to be unmarketable, or to acquire such property for a bad debt; it might be that a purchaser of a share *eo nomine*, of a retiring partner might, in the absence of special circumstances, be bound to take such title as a vendor had. But that would not excuse the vendor from showing what the title of the partnership was in the aggregate concern. Suppose the partner to have known that a title could not have been made, and the purchaser could prove such fact, would the court compel specific performance of the contract? Confessedly not. If the vendor is not bound to show this title, how is the purchaser to know whether he has got the subject of his contract? All that I decide is, that the vendor in the present case cannot simply refuse to show the title of himself and his coadventurers to the mines, the shares of which he had contracted to sell. Exceptions allowed.

## ACCIDENTS.

*Raffe's Quarry, South Shields.*—Ambrose Coe had his leg broken here from a fall of earth, in consequence of which he died in a few days.

*Bowling Colliery Company, East Bierley.*—A fire-damp explosion occurred on Saturday last at one of the pits of this company, whereby no fewer than 11 men and three boys were all more or less severely scorched—one of the sufferers, a youth named Barrett, has since died. The accident arose from one of the men suffering a hole to remain in the gauze of his Davy lamp. At the inquest, a verdict of "Accidental death" was returned.

*Caution to Colliers.*—Another instance of the recklessness with which some colliers prosecute their dangerous occupation took place a few days ago in a coal pit near Bilston. Some colliers descended the pit in question about 6 o'clock in the morning. One of them, Richard Thompson, was cautioned by another collier not to go up a gate-road until it had been properly examined by the doggy, but Thompson persisted in his original intention, and took with him a lighted candle. After he had proceeded some distance an explosion of fire-damp took place, and Thompson ran back, badly burnt about his arms, back, face, and breast. He was taken home, and was subsequently attended by Mr. Dunn, surgeon, of Wolverhampton, but after lingering from Monday to Wednesday morning, he died in consequence of the injuries he had received.—*Wolverhamton Chronicle.*

*Twidale, Sedgley.*—D. Jukes, a miner, was killed in a pit here, belonging to Messrs. Mason and Co.

*Priest Fields Porto Bello Colliery.*—James Cleyman was killed by an explosion; he was blown out of the cage while descending the shaft, fell in the sump, and was found dead.

Wm. Pitchford was killed in the same pit, by a fall of coal.

*Bullhouses Pit, near Penistone.*—A young man, about 17 years of age, had just descended the shaft, and was getting out of the corve at the bottom, when the other corve, which had been raised out of the pit as the one in which he was descended, fell down the shaft, and killed him upon the spot. It appears that the corve had been lowered rather suddenly upon the landing at the pit mouth, and becoming loosened from the rope by which it was suspended, fell down the shaft.

*Dreadful Accident at the Chapeltown Iron-Works.*—On Friday, an inquest was held at the Sheffield General Infirmary, on view of the body of William Childs, aged 68, whose death resulted from the following accidental circumstance. The deceased was one of the men employed at the extensive blast-furnaces at Messrs. Scholefield and Co.'s Iron-Works, Chapeltown; and, on the 19th of Nov., took charge of the furnace of which John Crowther was the regular keeper, but who was absent from his work on that day. There were between 4 and 5 tons of metal in this furnace, which was being melted by blast-heat, in order to be run into pigs. On the evening in question, the deceased was preparing to let off the liquid metal from the furnace into the moulds, and had driven the piece of iron through the "stopper," or clay composition, when he found considerable difficulty in withdrawing it. In endeavouring to do so, the whole piece of the clay composition became loosened. A man, named Richard Armitage, observing this—though it appeared to escape the attention of the deceased—knew that the weight of liquid metal in the furnace would, in a few minutes, force its way—thus leaving an outlet for the metal from 12 to 14 inches square, instead of one of 3 inches diameter, which the deceased was making. He immediately called out to the deceased—"Childs, come out of the way—the stopper's loose, and coming out altogether." The deceased neglected the caution, and continued to exert himself to get the bar out of the hole he had been making, when the whole piece gave way, and the liquid metal came in a flood upon him; and, before he could get out of the way, he was almost up to the knees in a pool of the boiling lava. Armitage immediately seized him round the waist, and lifted him out; but his feet and legs then presented a most frightful spectacle. His clothes, and the flesh about his ancles and legs, were burnt away, and his boots were also burnt to a cinder. In endeavouring to cut them off his feet, the flesh of the heels, &c., came away. At the poor man's own request, he was immediately removed to the Sheffield Infirmary, where he lingered until Wednesday week. The evidence of the witness, and the statement made by the deceased to his relatives, showed the lamentable occurrence to have been entirely accidental, and a verdict to that effect was returned by the jury.—*Sheffield Iris.*

IRISH ELK.—The greater portion of a skeleton of the ancient Irish elk, in a fossil state, was discovered last week at Timahoe, in the Queen's county, by some labourers employed by Mr. Joseph Edge in sinking a new mill-course. The remains were discovered at a depth of 8 ft., in a gravelly stratum, beneath some moory land, for many years a level meadow. The earth enclosing the skeleton had all the appearance of having never been disturbed. The head and antlers were preserved by Mr. Philip Cooper, of Timahoe.

NEBULA OF ORION.—The eighth annual meeting of the American Association of Geologists and Naturalists has been held at Boston, and been attended by a large number of scientific men from all parts of the Union. The following letter from Mr. Bond, to President Everett, of Harvard University, announces the resolution of the nebula of Orion:—"You will rejoice with me that the great nebula of Orion has yielded to the power of our incomparable telescope. This morning (September 22), the atmosphere being in a favourable condition at about three o'clock, the telescope was set upon the Trapezium, in the great nebula of Orion. Under a power of 200, the fifth star was immediatly conspicuous; but our attention was directly absorbed with the splendid revelations made in its immediate neighbourhood—this part of the nebula was resolved into bright points of light. The number of stars was too great to attempt counting them; many were, however, readily located and mapped. The double character of the brightest star in the Trapezium was readily recognised, with a power of 600. This is "Struve's sixth star," and certain of the stars composing the nebula were seen as double stars under the power. It should be borne in mind, that this nebula and that of Andromeda have been the last stronghold of the nebular theory: that is, of the idea first thrown out by the elder Herschel, of masses of nebulous matter in process of condensation into systems. The nebula in Orion yielded not to the unrivalled skill of both the Herschels, armed with their excellent reflectors. It even defied the power of Lord Rosse's 3 ft. mirrors, giving not the slightest trace of "resolvability," or separation into a number of single sparkling points. And even when, for the first time, Lord Rosse's grand reflector, of 6 ft. speculum, was directed to this object, "not the veriest trace of a star was to be seen." Subsequently his lordship communicated the result of his further examination of Orion as follows:—"I think I may safely say, that there can be little, if any, doubt as to the resolvability of the nebula. We could plainly see that all about the Trapezium is a mass of stars, the rest of the nebula also abounding in stars, and exhibiting the characteristics of resolvability strongly marked." This has hitherto been considered as the greatest effort of the largest reflecting telescope in the world, and this our own telescope has accomplished.—*U. States paper.*

## ON THE REDUCTION OF COPPER ORES.

*Copy of the Report of* RICHARD PHILLIPS, Esq., F.R.S., F.G.S., &c., *on* Mr. FREDERICK BANKART'S *Patent Process for Reducing Copper Ores.*

ROBERT FARMDALE, Esq.—SIR,—In compliance with your instructions, I proceeded, on the 10th October last, to Swansea, in order to witness Mr. Bankart's operations on copper ore, with the view of ascertaining the points referred to me.

1. What quantity of coal is required to reduce the copper from 10 tons of sulphur ore from Cuba, into copper precipitate, by Mr. Bankart's present improved experimental furnaces; and approximately by the furnaces Mr. Bankart proposes to erect?

2. What time and labour are required to effect the same object by the present experimental furnaces, and approximately what by the larger furnaces Mr. B. proposes to erect, and the general arrangement he proposes to adopt for lixiviation, precipitation, and crystallisation?

3. What quantity of copper can Mr. Bankart extract from the ore by the process, and what amount remains in the copper ore after completion?

4. What (if any) saving in time, and coal, and quantity of copper extracted, may be anticipated by grinding the ore finer than the dust used in the present experiment (which is the crushed ore as it comes from Cuba); and what by mixing the ores according to the plan detailed in Mr. Bankart's specification of his patent?

5. What quantity of iron is required to precipitate a ton of copper?

6. What quantity of sulphate of iron results when crystallised?

7. What quantity of iron does the refuse ore contain, after the copper has been extracted, and in what state is it?

In the first place, the ore operated on was the dust ore of the Royal Mines of the Cobre Association, in the state in which it comes from Cuba, but sifted through a sieve of 81 holes to the square inch. Of this there were weighed to the furnace 10 tons (of 20 cwts. to the ton), subject to deduction for the ordinary dry and waste weight, ascertained in the usual way, and amounting to 7 cwts. 3 qrs. 2 lbs., leaving, as the quantity of dry ore actually operated on, 9 tons 12 cwts. 1 qr. 26 lbs. The per centage of copper in the above, as assayed by Mr. Penrose of Swansea, was 12½; by Mr. W. H. Christoe, of Truro, 11. I shall, therefore, in the ensuing calculations, take the mean of the two assays above, or 11·69°.

| | ton | cwts. | qrs. | lbs. |
|---|---|---|---|---|
| The quantity of ore used ought, therefore, to have yielded of copper | 1 | 2 | 1 | 13 |
| The quantity of dry copper precipitate obtained was | 1 | 4 | 0 | 18 |

Mr. Bankart's process requiring the use of boiling water, for dissolving the sulphate formed by roasting the ore, he has, in his present experimental works, used a boiler for the purpose of generating steam. The coal consumed by this boiler will be noted separately from that required for the furnaces.

| | |
|---|---|
| The furnaces took for the operation, of coals 7 tons 10 cwts., consisting of | |
| binding, or bituminous, 5 tons 14 cwts., at 6s. 6d. | £1 17 0 |
| And of free coal, 1 ton 16 cwts., at 4s. | 0 7 3 |

The boiler consumed, of mixed coal, in equal quantities, 39 cwts., amounting to 10s. 3d. This last is an expense, as will appear afterwards, attaching to the experiment, and not to the process.

| | |
|---|---|
| The entire labour employed consisted of 4 furnace men, 13½ days, of 12 hours each day (2 by night and 2 by day), at 2s. 6d. | £6 15 0 |
| Foreman and deputy by night (specially for the occasion), also 13½ days, of 12 hours each, at 2s. 6d. | 3 7 6 |

Having thus concisely stated the facts furnished by the result of the experiment, by way of answer to the third and to the first part of the first and second queries, before proceeding to reply to the latter part of the two first and succeeding queries, it will be necessary to enlarge by way of explanation. The experiment was conducted under the disadvantages of a new commencement, after removing all traces of previous workings, and after various delays, such as the use of half charges, and the use of roasted ore in a wet state, owing to the necessity of apportioning the given quantity of ore to the prescribed arrangements of working.

The experimental furnaces are only small ones, barely admitting the use of a ton of ore at a time, whilst they necessitate the constant attendance of one man on each; they are also in many respects inconveniently situated as regards the rest of the work, but in this Mr. Bankart was guided by the circumstances of the locality. Ordinary calcining furnaces used in copper smelting-works vary in their capacity from three to six tons, and Mr. Bankart proposes to use a furnace of medium capacity, capable of containing 3 tons of ore, which is estimated as a suitable size, both for the full effect of the coal, and the amount apportioned to each man. It is also estimated that furnaces of the latter size would, in all probability, consume little additional coal, owing to the fact that the heat which is concentrated in the centre or body of the furnace is retained there for use, whilst little more is radiated by the external walls, or the raking holes in the larger than the smaller furnaces. The quantity of coal consumed by each of Mr. Bankart's improved roasting furnaces during the experiment did not amount to 6 cwts. per diem of 24 hours—a quantity so small as, when combined with the powers of the proposed furnaces, and the contemplated arrangements for crushing the ore fine, and saving manual labour by machinery, is a mere trifle; and this will be still farther diminished when a rich Australian or other ore of high produce is operated on.

It must also be remarked that in the experiment, the ore, though used as fine as the sieves at Swansea would reduce it, was far coarser than Mr. Bankart now, and in his specification, proposes to use it; and in illustration of this point, I instituted a comparative trial of the ore sifted as fine as proposed against that made use of in the main experiment—and the result was, that though equal in their produce, and tried under precisely similar circumstances, the fine took only one-third of the time occupied by the comparatively coarse. This may be taken as satisfactorily determining the question of whether it is desirable and economical to crush the ore fine, or use it as brought from Cuba, or in a corresponding state from other places. In reference to the point of crushing the ore fine, and the expense it may occasion, it must be borne in mind, that as in the course of the second and subsequent roastings, lump ore is used in preference (see specification); such lumps are, as they come from the furnace, quenched in water, and by this means are so disintegrated as to yield readily to either stamps or crushers.

The imperfect arrangement of the improved roasting furnaces and other apparatus from the cause alluded to, made it necessary, as previously stated, to use a boiler to generate steam for the washing of the roasted ore. This boiler consumed 3 cwts. of coal per diem of 24 hours, though the spare heat from the smelting and other furnaces would be amply sufficient to supply steam or boiling-water for washing purposes, as well as to concentrate the sulphate liquor. It was, moreover, in no day or night fully occupied, though it was nevertheless necessary to keep the steam up for use when required. The same may be said in respect of the labour of attending the boiler and washing apparatus—the boiler alone requiring the attendance of a man for four hours per diem to supply it with water, as circumstances rendered the employment of a force-pump essential, and the whole of the water used in the experiment, with the exception of a small quantity collected in a tank erected by Mr. Bankart, had to be pumped from the river, and that only at certain stages of the tide. The water used in the washing apparatus, amounting to 2500 gallons per diem, had also to be pumped from a lower to a higher level. The whole of this labour is included in the above expenses of the experiment.

During the experiment it was important that each department should be carefully attended night and day, though in ordinary circumstances it appeared that the furnace men attend to the washing apparatus at night—the foreman doing this duty during the day, and leaving his instructions at night. A part, therefore, of the labour of the men attending this department can only be chargeable to the experiment; whilst the extra labour devolving both on the furnace men and foreman, as above and afterwards mentioned, would, by the arrangement proposed by Mr. Bankart, and explained in the drawing annexed, and by the use of a steam-engine, be wholly saved. In the present experiment, and under the arrangements as I found them, the ore, after being drawn from the furnace, had to be lifted from under the furnace into the washing vats by manual labour, a height of 9 ft., and in the case of half of it to a distance of 20 yards, while on its return it had to perform a journey of nearly double the distance, also by manual labour. And here I would refer to a circumstance above alluded to, having an important bearing on the result of the experiment—viz.: the employment of wet roasted ore—the limited quantity of the ore operated on not allowing of a reserve between the washing of a charge and its re-roasting. This, it is right to say, is never permitted under ordinary circumstances, and on this occasion added greatly to the time, and consequently to the expense, of the experiment. With reference to the mixing of the various ores, as stated in Mr. Bankart's specification, the advantages must be manifest since the superabundant sulphur of the sulphur ores balances the absence of the sulphur in the carbonates and oxides; and consequently a larger quantity of copper can be extracted in a given time by the equilibrium thus produced, than could be if a large amount of sulphur had first to be expelled.

The quantity of iron required to precipitate a ton of copper is 17 cwts. 2 qrs. nearly, and the resultant sulphate of iron when crystallised is about five times the weight of the iron dissolved. Of the value of the sulphate of iron I have no means of judging, the price in London is about 3£. 10s. to 4£. per ton; but the means of cheap transit, or otherwise, must operate on so bulky an article.

The oxide of iron in the refuse ore will vary in amount according to the purity of the ores, from 46 per cent. downward; this may readily be converted into metallic iron in localities where fuel is abundant and cheap. Another important point in the economical working of Mr. Bankart's process, is the low degree of heat required in roasting, and the consequent small wear and tear of the furnaces, which to all appearances will last a very considerable time with slight repair.

The last point requiring notice is the process of washing the ore; this is easy, and perfectly effectual for the extraction and filtration of the sulphate of copper in solution, from which the copper is completely separated by the precipitation with iron.

An inspection of the nature and arrangements of the furnaces in the accompanying plan will show that the fumes are kept entirely distinct from the fire flues, and capable at any time of being condensed as sulphuric acid. This would entirely remove all nuisance, while even without this condensation the amount of fumes discharged into the air is considerably diminished. Having thus stated in explanation every material particular bearing upon the economy of the process, I proceed to recapitulate the results of the experiments, and contrast them with what, in my opinion, would ensue from the improved arrangement alluded to; and for the purpose of easier comparison, I have arranged them in a tabular form. In this summary I have assumed that the entire actual expense in coals and wages was fairly chargeable to the experiment, though a large deduction is due for the disadvantages under which that experiment was made, and I have then reduced the amount of each in the proportion which the facts warranted. To this rule, however, there may perhaps be an exception in the case of coals for the increased size of the furnaces when actual proof could not be afforded; and, therefore, to avoid all inaccuracy on this point, I have given a second line of figures, omitting all reduction on this account.

*Summary of Expense in Coals and Wages of reducing Ten Tons of Copper Ore (of 20 cwts. to the ton) by the foregoing Experiment, and probable amount under improved arrangements:—*

| | |
|---|---|
| Quantity of coals actually consumed by Mr. Bankart's two experimental furnaces, under all the disadvantages enumerated in my report—7 tons 10 cwts. | £2 5 0 |
| Quantity of coals which would be consumed by Mr. Bankart's proposed furnaces of *treble* the capacity of the present, at the estimated increased expenditure for such increased size—8 tons 15 cwts. | 1 2 6 |
| Quantity of coals which would be consumed if the ore were ground as fine as originally proposed by Mr. Bankart, by which the time would be reduced two-thirds—1 ton 5 cwts. | 0 7 6 |
| Per centage of copper in the ore used in the experiment 11½°, giving 1 ton 2 cwts. of metallic copper, or of coal, per ton of metal—1 ton 3 cwts. | 0 6 11 |
| Assuming the per centage of copper in the ore to be 20°, giving 2 tons of metallic copper, or of coal, per ton of metal—12 cwts. 2 qrs. | 0 3 10 |

But, as the above is a calculation without absolute proof, the second line of figures contains similar calculations, without deduction, in respect of size of furnaces respectively, for the three last items—2 tons 10 cwts., 15s.; 2 tons 7 cwts., 14s. 1d.; 1 ton 5 cwts., 7s. 6d.

Wages in the experiments—4 furnace men, one to each furnace night and day—furnace men, 6£. 15s.; foreman overlooker, 3£. 7s. 6d.—10£. 2s. 6d.—24 item, 3£. 7s. 6d.; 3d, 1£. 0s. 6d.; 4th, 1£. 1s. 1½d.; and, 5th, 11s. 3d.

By this summary the probable expense in coals and wages of extracting a ton of copper precipitate by Mr. Bankart's process, under the proposed improved arrangement, will be from 1£. 10s. 9d. to 16s. respectively, according to the per centage of the ore. In this estimate, the iron required for precipitation is not included, as the amount will always be the same per ton of copper, irrespective of the quality of the ore treated; its price must vary according to local circumstances, or as the iron is purchased or manufactured from the refuse oxide of iron. The quantity of copper remaining in the residue is 0·63 per cent.—R. PHILLIPS: *Craig's-court, Nov. 26.*

# Mining Correspondence.

## ENGLISH MINES.

BARRISTOWN.—In the 18 fm. level end west, the lode at present is very much scattered, in small branches, each of them carrying ore—worth about 6£. per fm.; this end is about 8 fms. west of Slob shaft, and the lode in the bottom of the end, for that distance, looked much better; the stopes behind this end, in the back, are worth about 6£ per fm.; the stopes in the bottom of this level are rather improved, and worth about 9£. per fm.; the stopes over Doyle's, in the back of this level, are worth about 16£ per fm., but do not lengthen east or west. The 12 fm. level end west is producing stones of ore, but poor; the winze sinking in the bottom of this level, on the middle lode, is looking rather better—worth full 10£ per fm. In the adit end east, the lode is smaller, and more ore through it, but not worth saving.—December 16.

BEDFORD UNITED.—At Wheal Marquis, the lode in the 90 fm. level, west of sump winze, is improved since our last report, and is now worth 20£. per fm.; in this level east, we still continue the cross-cut to cut the lode east of the cross-course. The lode in the 80 east is 2 ft. wide, producing good stones of ore; Hooper's winze, in this level, sinking on the north lode, is now down within 4 ft. of the 90—in which level we intend cross-cutting to the south lode, to effect a communication with the 90 west of the sump winze. The lode in the 70 fm. level east is 2½ ft. wide, producing stones of good ore; in the cross-cut at this level, driving south, we have not yet cut the lode, but expect to do so in the following week. The sump-shaft is sinking under the 80 fm. level, by eight men. The lode in the 25 fm. level, east of the south engine-shaft, is 2½ ft. wide, but not very productive. The lode in the adit level east is a little more favourable, and producing some stones of good ore.—Dec. 21.

CASCADE.—The men continue to drive the adit level 15 ft. in a week; the cross-course is now 3 ft. wide, composed of killas, flookan, and quartz, spotted with yellow copper ore and mundic.—Dec. 21.

COATLITHE HILLS.—During this week, the men have been again employed in clearing the level east from A shaft; and I hope to be able, in a short time, to explore to the end of the old workings.—December 18.

CUBERT.—In the 35 fm. level east we have been driving for several fms. on a large coarse lode, composed of spar, mundic, and stones of lead; but, believing there was some part, or lode, to the south of this lode, we thought it right to drive a little to prove it; in doing so we have cut a very promising lode, about 10 ft. apart from the other lode; it is 8 in. wide, composed of soft white spar, mundic, and lead, worth about ½ ton—say, 6£. per fm.—the ground about it is soft and blue; this lode, I doubt not, is Trebiskin lode, and must have overtaken or passed through the great lode between the 25 fm. and 35 fm. levels, and now, of course, it is to the south instead of the north, of the great lode; I consider this to be a most important thing as to future benefit; in the west end in this level the lode is not so large and hard as it has been; it is now 18 in. wide, yielding some good saving work. Within the last day or two the 25 fm. level has much improved; this lode is from 8 in. to 10 in. wide, worth ½ ton per fm.; I would just remark, that over this end we have a pitch working in the bottom, where the men are raising one of the best parcels of work that ever has been raised in the mine. Going west in the 15 fm. level the lode at the present time is in two parts—the north part is 14 in. wide, very rich in mundic, intermixed with lead; the south part is 12 in. wide, soft spar, and some good saving work; from its present run they will soon be together—a promising end. The engine-shaft is down about 6 fms. 3 ft., ground much as usual. I beg to say, if we could afford to push on our levels, which are now idle, I do believe we should get on well shortly.

DEAN PRIOR AND BUCKFASTLEIGH.—The lode in the bottom end west still holds out a very promising appearance; I have set a pitch in the back of the level at 12s. in the 1£., by two men, and, from the present indications, the tributers are in full expectation of being well remunerated for their labour. In the rise, in the back of the 10 fm. level, the lode is from 5 to 6 ft. wide, producing some saving work. We are getting on with the sinking in the engine-shaft, and shall lose no time as to carrying it into effect. We have commenced this day about fixing the launders over the 24-ft. water-wheel, in order to carry the water over the wheel—therefore, we shall make the necessary preparations required, so as to get the drawing machine to work with all possible speed.—Dec. 21.

DEVON AND COURTENAY CONSOLS.—In our deep adit level the lode is 2 ft. wide, composed generally of spar and mundic, with spots of copper ore; the lode in this level has, within the last 6 ft., increased in size, and carries with it strong indications of improvement, which is daily expected. The ground in the cross-out, driving north from engine-shaft, to intersect the lode, continues favourable for driving, and I expect we shall cut the lode in about seven or eight weeks from this time. The men in the pitch, on the north lode, continue to raise some good work for lead ore.—Dec. 21.

DRAKE WALLS.—In Brenton's engine-shaft, no alterations since my last—still very good; but little has been done in sinking, in consequence of the late heavy rains. The sumpmen are stoping east under the 50 arch, until the surface water abates, when they will resume their sinking again. In the 50 end, under the arch, east of Brenton's, good branches. In the stopes, east of Brenton's, under the 40, good work; the 40 end east, under the arch, is holed to machine shaft, the above end has gone through good tin ground for many fms.; the stopes, west of machine shaft, below the 40 end, under the end referred to, good work; the stopes, east of machine shaft, under the 40, saving work. The stopes, east of machine shaft, under the 33 arch, good branches; in the 33 end east, under the arch, good branches, but has been poor for the last 2 or 3 fms. I intend sampling, on Monday next, (say) 20 tons. We should have had over 20 tons as promised; but, from the severity of the weather, which has prevented our dressing to the extent that we should have done if the weather had been favourable. Such weather has not been known for many years in this neighbourhood. The remainder of the new engine is not yet arrived.—Dec. 18.

EAST CROWNDALE.—The ground in our engine-shaft is not quite so good as when last reported upon, the killas being harder, and intermixed with branches of spar and capel—one of those branches about three inches wide, producing good stones of yellow copper ore; we have sunk the past week 4 feet 6 inches. In the 47 fathom level, driving east, on the north lode, there has been a great improvement; the lode is about 2 feet wide, with a leader in copper, 7 inches wide; the other parts are capel, peach, spar, and spots of ore; from its very favourable appearance, you may safely calculate on good returns from this level. It has been decided to drive west, in the 47 fm. level, on the course of the north lode, where I anticipate, in a short time, to cut a course of ore. The lode in the adit level west, at Rix Hill, still continues poor, is 2½ ft. wide, composed of capel, spar, peach, mundic, and spots of tin; on the south lode in this level, we have broken some excellent work for tin in the past week; this lode is 6 ft. wide, having a course of killas in the middle, which accounts for my having stated last week its size to be 18 in. wide, not having then cut the regular south wall; it is composed of killas, peach, spar, and good floors of tin. In our new engine-shaft, at Rix Hill, we have broken some excellent rocks of tin in the beginning of the week; but, from the great quantity of rain which fell last night, we have not been able to take down the lode to-day, the shaft having filled with water. We have gone down 5 ft. by the side of the lode, and fully calculate on a rich pile of work when it is taken down, which I hope will be on Monday, when I will advise you of its appearance.—December 18.

GALLOWAY.—The east and west lodes, upon which we are cutting an open cast, are very wide; we have from 10 to 12 ft., but not the south side. The north and south lode, which we have traced up to it, is also larger—much larger, than in the old workings. If the weather prove favourable, we expect to commence sinking a shaft on course of the east and west lode, very near the intersection, in course of the coming week.—Dec. 18.

GREAT MICHELL CONSOLS.—The lode in the sump winze is 5½ ft. wide containing spar, mundic, and ore, producing some very good saving work. In the 35 fm. level, west of the sump winze, the part of the lode being carried 4 ft. wide, contains abundance of mundic, with black, grey, and yellow ore intermixed throughout. We sampled at Wadebridge, yesterday, a parcel of ore, computed at 52 tons.—Dec. 21.

HOLMBUSH.—The ground in the 132 fm. level, south of the diagonal shaft, is more favourable for driving than when last reported on. In the 120 fm. level south, west of the slide, we have also favourable ground, with a pretty deal of water issuing from the end, which no doubt is proceeding from the lode, and the end is not far from it; the lode in the stopes, above the 120 fm. level, east of the great cross-course, is 2 ft. wide, producing 2½ tons of ore per fm. The lode in the rise, above the 110 fm. level south, is 20 in. wide, composed of quartz and lead, worth 5£ per fm., with favourable ground for rising. The lode in the 100 fm. level south is 3½ ft. wide, composed of quartz and stones of lead, saving work; one of the tribute pitches in the back of this level, is improved; the other tribute pitches are still yielding a fair quantity of lead ore. The lode in the 90 fm. level south is 20 in. wide, composed of flookan, spar, and stones of lead. We would, likewise, beg to inform you, that we are preparing a small parcel of silver-lead ore for sale as quick as possible.—Dec. 21.

KIRKCUDBRIGHTSHIRE.—The lode in the 50 fm. level end west is of similar size as last reported, containing stones of lead. The lode in the 40 fm. end is large, 5 ft. wide, producing one-third of a ton of lead per fm.; the lode in the winze, sinking under this level, is principally to the south of us, the lead going down much more perpendicular in a part of the lode, and is producing 1½ ton of lead per fm.; this winze and the two pitches over it, form a novel feature in this lode, as the lead in the latter is principally discovered north apart from the run of the lode. The lode in the 30 end is 5 to 6 ft. wide, not so good as last reported, yielding now about three-quarters of a ton per fm.; the pitches in bottom of this level are looking remarkably well. The lode in the 20 fm. end is 3 ft. wide, yielding some fine stones of ore—the same will apply to the lode in the bottom of Keith's shaft. We shipped a part of our lead to-day, and hope to finish the remainder on Monday next; the weather during the week having been excessive wet and stormy, has delayed us in this business.

LEWIS.—The lode in the engine-shaft, sinking below the 60 fm. level, is 2½ ft. wide, unproductive at present; we hope to get the above shaft down to the 70 fm. level in the early part of next month, soon after which we shall be preparing to drive south, in order to cut south branch, when I hope to find it as productive as in the level above. The lode in the 60 east is 2½ ft. wide, producing some good work for tin, and very promising; the lode in the rise, in the back of the 60, on south branch, is 1 ft. wide, worth 12£. per fm., and very promising. The lode in the winze, sinking below the 50 fm. level, on south branch, is 10 in. wide, worth 10£. per fm., and very kindly. Some of our tributers in the back of the 50 and 60, on north lode, east of engine-shaft, are raising some good parcels of work.—Dec. 18.

MENDIP HILLS.—I have suspended operations in the 88 fm. level, north of shaft, and reduced the number of men in the south end, which is now being driven by two men; the appearance of the lode continues the same as for several fms. past, consisting of flookan, iron, and spar. In the slag department, I regret to say that progress has not been made during the past week as I could wish. In consequence of the incessant rain we have been visited with, the carpenters have not been able to get on with the tram-road, or the masons with flues, &c. In the bunch opening across the valley, we are still breaking some good slags; and the large bed of slag, mentioned in my last, continues to hold forward.—Dec. 20.

SOUTH WHEAL TRELAWNEY.—Snell's engine-shaft is in course of sinking, with nine men, down under adit 20 fms., the ground in which is still favourable—water a little quicker.—Dec. 20.

TINCROFT.—I cannot speak of any particular improvement in the tutwork department of the north mine. Since my last report, some of the pitches have a little improved. We are sinking Palmer's shaft below the 80 fm. level, being on the south part of the lode; we have but little ore. The lode in the 80 end west will produce 1 ton of ore per fm., worth from 5£ to 6£ per ton. The lode in the winze, sinking below the 70, is 2 ft. wide, producing 1 ton of ore per fm., worth 5£ per ton. The lode in the 70 end west is 3 ft. wide, producing 4 tons of ore per fm., worth 5£ per ton; the lode in the end, driving to meet the last-named end, is 2 ft. wide, producing 3 tons of ore per fm., worth 5£ per ton; the lode in the stopes, in the bottom and back of the 70, is 3 ft. wide, yielding 4 tons of ore per fm., worth 5£ per ton. The lode in the 60 west will produce ½ ton of ore per fm., same quality as at other places. The 48 end west is unproductive. In the south mine, we have holed the winze that was sinking in the bottom of the 120, to the rise in the back of the 142, now having a good ventilation. We shall extend the 142 east towards the unproductive ground gone over in the 120, and shall be stoping the back of the 142 in the most productive part of the lode—both the end and stopes are producing tinstuff; that part of the lode on which we are driving the 120 east, is worth 12£. per fm. for tin; the stopes in the back of this level are worth 14£. per fm. The winze, sinking below the 110, is worth 20£ per fm.; the stopes in the 110 are worth 20£; the pitches on the whole are looking a little better. The 90 end west, on Chappel's lode, is producing some good quality ore, and kindly. At Wheal Providence, we are preparing to fix plunger lift, which will occupy yet a few days; we are getting on pretty well driving the adit end towards Stainsby's shaft; but the water is too powerful in the shaft to be kept by horses. I expect we shall sample 400 tons of copper ore on Wednesday next.—Dec. 20.

TRELEIGH CONSOLS.—Christoe's shaft, below the 110 fm. level, is sinking in the country. In the 110, east of Christoe's, the lode is 2½ ft. wide much improved in appearance, with a little more ore. In Garden's shaft, below the 100, the lode is 3 ft. wide, and rather of a promising character, with stones of ore. In the 100, west of Garden's, driving south, the lode has elvans, mixed with veins of ore; in the 100, east of ditto, the lode is 3 feet wide, but little mineral. In the 90, west of ditto, the lode is 2 ft. wide, and more promising, with stones of good ore. In the winze, below the 90 west, the new lode is 2½ ft. wide, worth 30£ per fm. In the 80, west of ditto, the lode is 2 ft. wide, with rather more ore, but not to value. In the rise, above the 70 west, the lode is 1 ft. wide, but little ore. In the winze, below the 60 west, the lode is 2 ft. wide, with stones of ore only. Wheal Parent engine-shaft is sinking in the country. The adit cross-cut north is driving towards the new shaft. In Lockett's shaft, below the 10, the lode is 1 ft. wide, with occasional stones of ore.—Dec. 18.

WEST WHEAL JEWEL.—In the 57 fm. level, west of Williams's cross-course, on Wheal Jewel lode, the lode is 1 ft. wide, worth 3£ per fm. In the 42 fm. level, east of the little cross-course, on the south lode, the lode is 9 in. wide, producing stones of ore. In the 30 fm. level, west of Quarry shaft, on Tolcarne tin lode, the lode is 18 in. wide, unproductive. In the 20 fm. level, west of Quarry shaft, on the same lode, the lode is 1 ft. wide, worth 5£ per fm.; in the deep adit, west of Quarry shaft, on the same lode, the lode is 1 ft. wide, worth 10£ per fm.; in the shallow adit, west of Quarry shaft, on the same lode, the lode is 1 ft. wide, unproductive; in the stopes, in the bottom of the adit, east of Pryor's winze, on the same lode, the lode is 5 ft. wide, worth 45£ per fm. In the stopes, in the back of the 12, west of Pryor's winze, the lode is 4 ft. wide, worth 30£ per fm.—Dec. 20.

WHEAL ADAMS.—The rise in the 50 is communicated with the winze sunk from the 40, and thus a good piece of ground is laid open, and both levels well ventilated; the eastern lode, in the 50 south, is worth 11£. per fm., while that of the quartzose is worth 8£. per fm.; the tributers who are working in this level, on the western lode, at 8s. in the 1£. on the value of the lead, are getting good wages, and the stopes are looking well. The other places are producing a fair quantity of ore, which is being dressed with every possible dispatch. The 30 tons of lead, sold to Mr. Treffry, have been duly shipped, but we have not yet succeeded in getting a vessel to take the lead, gossan, mundic, &c., to Llanelly, although we expect one at Teignmouth in course of the week.—Dec. 22.

WHEAL MARY ANN.—Trelawney 42 fm. level having been driven to their boundary, we have commenced driving it towards Barratt's shaft by six men; the lode at present is small and poor, but we shortly expect an improvement, as there is a good lode gone down in the level above, a few fathoms before it. The lode in the 30 fm. level, south of Barratt's shaft, is not so good as was last reported, being now 2½ ft. wide, and worth 14£ per fm. Pollard's shaft is sunk 9 fms. below the 15 fm. level. The lode in the 15 fm. level, south of Pollard's shaft, is 15 in. wide, composed of gossan and carbonate of lead. The stopes are producing fair quantities of lead. We have about 12 tons of the silvery mundic and lead dressed, and have had a sample of it assayed this day, which produced 3 in 20 for lead, and 32 ozs. 2 dwts. of fine silver to the ton of ore.—December 20.

WHEAL SAMSON.—The lode in the present level continues to improve as we drive towards the junction—it is full 6 ft. wide; the walls are beautifully regular, and the gossan and mundic exceedingly fine and rich in quality; there is every indication of a mass of ore when this mine is worked at a proper depth; several hundreds of pounds worth of silver are well known to have been returned in former times from the very small bunches met with in the branches. We certainly have now discovered the main lode, and a beautifully formed lode it is; and there cannot be a doubt of a large quantity of ore in depth.

WHEAL TRELAWNEY.—The ground in Phillip's engine-shaft is still good for sinking. The lode in the 52 fm. level end is large, and worth 12£ per fm.; in this level north, the lode in the end is worth 15£ per fm. The stopes in the back are similar to the last report. The 42 end north is again resumed, where the lode is worth 13£ per fm.; the stopes here are producing a fair quantity of ore, particularly two to the south of the winze, recently holed near the north end; the stopes in this level south, wrought by six pares of men, are producing a good quantity of ore. The lode in the 32 north is worth 9£ per fm.; here the ground is easier than was last reported; the stopes in the back of this level are producing a moderate quantity of ore. Trelawney's shaft is now sunk 14 ft. under the 42 fm. level, where we are preparing to fix a 20 fm. lift, preparatory to our sinking this shaft to a deeper level. The 42 cross-cut west is extended about 7 fms. from the shaft, where the ground at present is rather hard. The 22 cross-cut east is continued, and without much alteration. The 30 fm. level, at Trebane, being extended nearly to the north boundary, has drained our winze at Vivian's, where we shall immediately drive our 30 fm. level north.—December 21.

## FOREIGN MINES.

SOUTH AUSTRALIAN MINES.—*Tungkillo Mines, Aug.* 20.—Baker's lode was cut on the 14th August; its first appearance was not so good as I had hoped, but, upon turning to drive north, in order to hole to the winze sunk on the lode, from the 20 fm. level, we struck a vein of rich ore, opening wider as we proceed, and better in the bottom, where it was about 1 ft. to 15 in. wide, and solid; the ore seems to be chiefly grey carbonate. The length of the cross-cut is 52 fms. 4 ft. 6 in., and has occupied 12 months in completing. By the sound, I consider the winze to be about 3 ft. lower than the cross-cut, and about from 9 ft. to 2 fms. distant. In the bottom of the winze there is a good lode of ore, of which that cut in the cross-cut is, in all probability, the continuation. Anstey's lode: since the date of the last report, Knuckey's winze has been stopped, owing to the increased pressure of the water; in the bottom, the lode is from 6 to 9 ft. wide; and, in the centre, there is about a foot wide of good ore—chiefly yellow and black ore, strong greens, and spots of ore through the remainder. About 12 fms. further south, another winze has been commenced, to sink under the 10 fm. level, in which the lode appears about 5 ft. wide; we have taken some good ore from it, and it appears to improve as it goes down. The 10 fm level, driving south, appears much the same as at the date of the last report. There is no material alteration in Hagen's lode. M'Beth's lode: a winze has been commenced below the 5 fm. level; the lode, at present, is about 3 ft. wide, with a very promising appearance. In the 5 fm. level, driving south, the lode is not so large as in the winze; but contains some ore, and very strong indications.—Extract from the *South Australian*, of July 29:—"The English company have discovered an extremely fine lode of copper at their special survey at Reedy Creek; one of the specimens, containing red oxide, which we have seen, is said to be the richest of any yet discovered."

IMPERIAL BRAZILIAN MINES.—*Congo Soco, Oct.* 13.—At Bananal, Walker's shaft is within two or three fathoms of the depth of Thomas's; and at this level we have intersected a stratum of rock, which admits water (doubtless from Thomas's shaft and the great sink, which are full) so freely, as to impede our workings, and impair the efficiency of what we may do. Although we have had a few fine showers, the surface water is still insufficient to enable us to drain the mine; we have, therefore, unanimously thought it best to cease our labours in Walker's shaft, until our pumps can be worked with full force, when we expect the other parts of the mine, being dry, will allow us to resume sinking, under more favourable circumstances. This shaft has been hitherto sunk through micaceous slate rock, but we believe, from the dip and the bearing of the other rocks in the neighbourhood, that we are very near the jacotings, and that the influx of water is due to this proximity. We have again intersected the stratum of clay which the adit from Walker's shaft had already once touched: with this exception, and that of one of the shafts needing a small pump (which we had foreseen), all the operations in the adit level are proceeding well; the wheel-pit is also being sunk very rapidly. The new rego is advancing towards completion. The masonry will be soon ready for the reception of the saw-mill, and the kitchen is almost in order. Every thing advances well and rapidly.

Gold workings at Congo, from the 3d to 13th Oct.—9 lbs. 11 ozs. 11 dwts.

## CALLINGTON MINES COMPANY.

The usual quarterly meeting of shareholders in this company, was held at the offices, 44, Finsbury-square, on Wednesday last, the 22d inst.,

R. HODGSON, Esq., in the chair.

The CHAIRMAN read the notice convening the meeting, and the following

DIRECTORS' REPORT.

Since the last quarterly accounts, the anticipations of success then expressed by the directors and agents have been for the most part realised, as you will perceive by the agent's report. The accounts will be submitted for your consideration to the end of September last. The reserve fund has been increased to 610*l.* 19s. 6d.; but it is to be observed that the balance would have been considerably augmented, but for the fall in the price of lead, which has materially militated against the profits of the company. By Capt. Phillips's report, it can be seen that the lode, in the 70 fm. level east, is worth 40*l.* per fm., and that a pare of six men will, if it so continues, break 50 tons of ore per month; besides this, however, levels are being extended in the 25 and 35, in the most eastern part, and in the 40, 50, and 90, from the north mine: thus it will be seen, that everything is being done to produce immediate profits; and, judging from the 70 fm. level, it is apparent, that when all the levels are driven on this lode, and in full operation, such returns are likely to be very large. The captain's report furnishes a much more propitious account of the north mine, and state of the lead lode, than that presented at the last meeting; and, with regard to the surface work, it is stated, that the principal object of erecting the house for the Kelly Bray engine, is progressing with activity. In all respects, therefore, these mines are progressing with activity; and the engine, which has been purchased of the Llancynfelin Company, is on its way from Wales.

He then read the following special report from the agent, Capt. Phillips:—

AGENT'S REPORT.

*Callington Mines, Dec.* 20.—In presenting you with a report of our present prospects, I beg, first, to call your attention to the eastern part of our setts, more particularly the lode now being developed (Kelly Bray). Our operations in the engine-shaft have been completely at a stand, being inundated by the water, which found its way in the 30 fm. level from the surface, through a hollow lode, to our deeper levels, driving from the north mine, and causing considerable increase to our water in this part. The 25 fm. level is being driven west, on a lode varying from 18 in. to 3 ft. wide, and is composed of spar, mundic, black jack, and copper ores, rather hard; the lode carries more copper just where the gossan is leaving, about 20 fms. deep, than here; and in the back of this level, where a pare of tributers are working, we find black ores coming in. In the 40 fm. level from the north mine, we find several branches of this lode producing copper ores. Being much inconvenienced in our eastern levels for want of air, we have put the men to sink on the east side of the cross-course, and expect, in a few days, to commence with the 50 fm. level, which is now being driven after the heave of this lode in very favourable ground; should it continue as soft as it now is, we expect to cut the main part by the beginning of February; we also expect to get the rise, in the back of the 70, nearly to this point at the same time—so that we shall then have perfect ventilation to the east of the cross-course, to make a fair start with our levels for Kelly Bray engine-shaft, stoping the backs of such levels, at the same time, as we find productive. In the 70 fm. level the lode is nearly 4 ft. wide; the ore is on the south part, and worth about 40*l.* per fm; at this time there have been 5 fms. driven since we first cut this bunch, and, should it prove to be as regular, and continuous as the character of it leads us to expect, a pare of men (six) will break, in a back, 50 tons of copper ore per month; this point is a little more than 60 fms. to the west of Kelly Bray engine-shaft, and about 100 fms. deep from surface. The rise in the back of this level is nearly 10 fms. high; the lode was rather poor some days since—at present it is improved, about 2 ft. wide; the orey part is 1 ft. big, good work. The western end of the rise, nearest to the cross-course, is poor all the way up; whilst, in the eastern end, we have a good breast of ore ground.

The ore just now coming in the rise, after being poor, speaks very favourably for the 50 fm. level, as it is not intended to drive a 60. These remarks will enable you to see our position clearly with regard to this lode, and to discover that we shall soon be enabled to make handsome returns from this part. The 90 fm. level is driven on this lode 30 fms. towards the great cross-course; the ground, for the last few fathoms, has been hard; at present, it is improved and favourable; this lode is also cut, but not driven on, in the 100 fm. level. This part of our sett—viz.: the eastern—possesses many interesting features, and I have no doubt will open, in a few years, a large field of mining—having different lodes running parallel, or nearly so, to the Kelly Bray, intersected by different cross-courses, and two channels of elvans; these meet the lodes in a very oblique course, and will without doubt prove highly beneficial to them—the one dipping north, and the other south.

At the north mine, we are rising in the back of the 100 fms. level, on the lead lode, to the south of the Kelly Bray, and expect to complete the same to the 90 in a day or two; the lode is continuing its regular size, producing rich work, and the back will be taken away at a low figure. The Kelly Bray lode, having a south underhale, has a very good effect on the lead course, as the soft and more productive ground has always kept with, or rather a few fathoms to the south of this, and continuing so far north, as this level has been driven now about 40 fms. from our northern boundary; we are not driving here for the present, the air being deficient. In the 90 fm. level south the lode is small and disordered, producing sliver-lead ore; in the north end a portion of the great cross-course has fallen with the lead lode, which is rather poor in this place. At the south mine, in the 125 south an improvement has taken-place in the ground—the lode also has a more kindly appearance; it is 1 ft. big, work of a moderate quality; in the north end the lode is 1 ft. big, producing silver-lead ores. In the 112 fm. level north the lode is more regular and promising, 1 ft. wide, work of a moderate quality; in the south end we are opening tribute ground. In the 100 fm. level north we are driving in the elvans; the lode has not been taken down. In the 90 fathom level we have a cross-course, the one the adit is driven to Hurldown; the lode producing work at fair tribute. In the 80 fathom level north we are opening ground that will work at a high figure; we have about 7 fms. to drive to communicate with the north mine; this, when accomplished, will afford much better ventilation to the south mine—a very desirable object. The weather has been very unfavourable for several weeks, much retarding surface operations—the engine-house at Kelly Bray progresses slowly; should the weather prove more favourable, all the loading will be accomplished in a day or two.

The following is the statement of accounts alluded to in the report:—To costs for three months, 5975*l.* 9s. 4d.; discounts and interest, 30*l.* 15s. 3d.; London management, 112*l.* 10s.; sixth dividend, 1000*l.*; reserve fund, 100*l.*: balance, 298*l.* 17s. 6d.—7517*l.* 12s. 1d.—By silver ores sold, 5945*l.* 9s. 7d. Kelly Bray, 669*l.* 9s. 6d. (less ores sold 387. 16s 1d.), 281*l.* 13s. 5d.; copper ore and silver, 419*l.* 12s. 10d.; balance from last quarterly account, 870*l.* 16s. 3d.—7517*l.* 12s. 1d.—To above balance of 298*l.* 17s. 6d.; subsist. 259*l.*; copper ore on hand, 240*l.*; old iron, 12*l.*—809*l.* 17s. 6d.; and reserve fund amounted to 610*l.* 19s. 6d.

Some conversation then ensued on the accounts, and the present prosperous nature of the mines. At Kelly Bray, the directors had thought it better not to make a call, as it gave every indication of not only paying all its expenses, but of becoming a rich mine; 6000*l.* worth of ore was already in sight, and as it was naturally expected the lode would hold good in depth and length, 10 times that quantity might be calculated as being shortly open.—The CHAIRMAN remarked, that the directors had had under their serious consideration the policy of making a 10s. dividend at this meeting, but they had decided not to do so, as they hoped to pay 20s. at the next meeting.—The report and accounts were then adopted; and votes of thanks (for which see our advertising columns) having been passed to the chairman, directors, Mr. P. Johnson, the company's adviser, and the agent, Capt. Phillips, the meeting broke up.

## WHEAL SETON MINING COMPANY.

At the two-monthly meeting of adventurers, held at the mine, on Tuesday, the 14th inst., the accounts were allowed and passed, showing labour cost for Sept. and Oct., 2413*l.* 2s. 9d.; merchants' bills, 912*l.* 4s. 10d.—amounting together to 3325*l.* 7s. 7d.—By copper ores sold (less dues), 5790*l.* 17s. 7d.—leaving a profit of 2465*l.* 10d., which, added to balance of the last account, 1914*l.* 14s. 9d., makes an available sum of 4380*l.* 4s. 9d., from which deduct dividend of 20*l.* per 99th share, 1980*l.*—leaves a balance in favour of the mine of 2400*l.* 4s. 9d. It was then resolved, that a dividend of 20*l.* per share be made, and paid to the adventurers forthwith, and that the balance in hand be carried to the next account. That the recommendations of the agents, with respect to a steam-whim and crusher, be adopted; and that Capt. Michael Loam be requested to prepare a specification for the machine, and that the same be forwarded to the founders to tender for; the same to be delivered on the mine by the 20th May next—tenders to be sent in on the 31st Dec. next. That Capt. Wm. Bray be allowed 12 guineas for making a plan and section of the mine, and one guinea per month, commencing from the 1st July last; and that the next meeting be held at the mine on the 8th day of February next.

The following agent's report was read:—"Bull's shaft is sinking below the 90 fm. level—down 6 feet. The 90 fm. cross-cut north is extended 7 fms.—ground hard for driving. The 80 fm. level west, on the south caunter lode, is 3 ft. wide—worth 15*l.* per fm.; the stopes in the back of this level are worth 30*l.* per fm. In the 70 fm. level west, on ditto, lode 5 ft. wide—no south wall—worth 10*l.* per fm. The stopes in the back of the 60 fm. level west, on ditto, are worth 30*l.* per fm. The stopes in the back of the 50 fm. level, on ditto, are worth 30*l.* per fm. The 80 fm. level west, on the north caunter lode, is worth 200*l.* per fm.; the stopes in back of this level are worth 180*l.* per fm. In the 70 fm. level west, on ditto, lode worth 30*l.* per fm.; we are only carrying 4 ft. of the north part of this lode; the stopes in the back of this level are worth 120*l.* per fm. In the 60 fm. level west, on ditto, the lode is divided into three parts; we are driving the north part, which is about 1 ft. wide, containing stones of ore; the stopes in the back of this level are worth 150*l.* per fm. In the 50 fm. level west, on ditto, lode worth 30*l.* per fm.; the stopes in the back of this level are worth 40*l.* per fathom. The 40 fm. level west, on ditto, is suspended for the present, being in disordered ground. In the 80 fm. level east, on Kneborne's branch, lode 3 ft. wide—worth 15*l.* per fm. In the 70 fm. level west, on ditto, lode worth 10*l.* per fm. In the 60 fm. level west, on ditto, lode 1 ft. wide, unproductive; Tilly's shaft is down 7 fms. 3 ft. below the 50 fm. level; we expect, by the end of February next, to complete it to the 60 fm. level. We have commenced a cross-cut south from the last-mentioned shaft, in the 50 fm. level, to meet the north cross-cut in the same level; there are 21 fms. further to drive to communicate, which will, probably, take until the end of March to accomplish. The water is now in fork at Cock's shaft, in the 44 fm. level, but it will take the present to enlarge it to that depth. The 60 cross-cut north is extended 88 fms. beyond the north caunter. We beg to report, that it is necessary there should be erected another steam-whim, and crusher attached, for the advantageous working of the mine; the present whim will barely keep the stuff, and crush what we now raise; and, in a few months, our produce will be considerably increased from Tilly's shaft, and we shall have to draw from Cock's and Harvey's shafts, and the present engine is wholly inadequate to perform such duty. In addition, we may state that our halvans are rapidly increasing, and that we have no power to return them; and from this source alone the costs of our engine would be shortly repaid, and a considerable saving would be effected in substituting for horse-power in drawing from Cock's and Harvey's shaft."

## WHEAL TREHANE MINING COMPANY.

A general meeting was held at the mine, on Friday, 17th inst.—Mr. J. C. ISAAC in the chair,—when the accounts were produced, showing—labour cost and materials for August and September, 591*l.* 13s.; lords' dues, 58*l.* 16s. 3d.; dividend declared 12th October, 256*l.*—906*l.* 9s. 3d.—By ores sold the Tamar Smelting Company, 909*l.* 19s. 7d.; balance in favour of the mine, 12th Oct., 67*l.* 13s. 9d.—leaving a balance in favour of the adventurers of 67*l.* 4s. 1d., on which a dividend was declared of 20s. per share, payment to be deferred until the ore bill becomes due on the 7th Feb. The following report of Capt. S. Richards was submitted to the meeting:—"Since the general meeting, held on the 12th October last, we have completed the bob beds, bobs, pulley frames, and other works required for laying about 80 fms. of horizontal rods for connecting the pump-work in Kelly's shaft with the Trelawney engine, the whole answering remarkably well; divided and cased Kelly's shaft from the surface to the 35 fm. level; dropped the pitwork required; and sunk the shaft 7 fms. 3 ft. 9 in., which makes the present depth 9 fms. 9 in. below the 35 fm. level. In the last 2 fms. sinking, the ground has been entangled with small branches of spar, which has impeded our progress here: but it is now nearly clean killas, and favourable for sinking. There are 2 fms. more to sink to get deep enough to communicate with Trelawney 32 fm. level, our 45; this, and the driving a 45 fm. level cross-cut to the lode, shall be done with all possible speed. The lode in the 35 fm. level north, in the ground driven 10 fms. since last report, has produced 7 cwts. of lead per fm.; and the lode in the present end is worth 18*l.* per fm.; the stopes in the back of this level, north of Kelly's shaft, will produce 8 cwts. of lead per fm.; the lode in the south stopes, in the back of this level, is producing some tolerable good work. In the 30 fm. level north, in the last 7 fms. driven, the lode has produced about 9 cwts. of lead per fm.; the stopes, in the back of this level, are turning out some good work, and the lode has a very promising appearance. In driving north, through the school field, the lode has taken a more westerly direction than in the south part of the mine, consequently the line of lode has considerably lengthened northward, making the length of ground in the sett on the course of the lode in this level 104 fms. 3 ft.; and should the lode in depth underlie as little as it does from this to the 35 fm. level, and also as it does in Trelawney deeper levels, the ground on the course of the lode will not be much shortened at a considerable depth. There is a good lode gone down nearly all the length in the 30 fm. level in the school ground, and also in the bottom of the 35 fm. level from the southern boundary to the present north end; and, in about five weeks from this time, I expect the lode will be cut in the 45 fm. level. The charge for a supply of water for dressing our ore and working our flat-rods is 16*l.* 10s. per month. The expense of the flat-rods, bobs, &c., is about 220*l.* With this machinery the shaft may be sunk from level to level for developing the lodes as well, and in the same time, as with a steam-engine on the mine. In conclusion, I have much pleasure in saying, that altogether the prospects of this mine are very good. The last parcel of ore, 55 tons 12 cwts., sold at 16*l.* 7s. 6d. per ton, and we shall sample, on Wednesday next, about 48 tons, of good quality."

## WHEAL TREMAYNE MINING COMPANY.

At a meeting of adventurers, held at the offices of the company, George-yard, Lombard-street, on Wednesday, the 14th inst., the accounts were presented and allowed, showing—By sales of copper ore, 1010*l.* 1s. 3d.; black tin, 1596*l.* 10s. 9d.; arsenic, 70*l.*; silver ore, 28*l.* 1s.; debts received, 8*l.* 6s. 6d.—2712*l.* 19s. 6d.—less lord's dues (1-20th), 135*l.* 4s. 7d.—2577*l.* 14s. 11d.—To Sept. cost, labour and merchants' bills, 1154*l.* 6s. 1d.; Oct. ditto, 1207*l.* 2s. 1d.—2361*l.* 8s. 2d.—leaving balance, 216*l.* 6s. 9d.; balance from last account, 499*l.* 15s. 11d.—debtor balance, 283*l.* 9s. 2d.—It was resolved, that the shares should be sub-divided into 1024ths, and that certificates be prepared and delivered to the several shareholders, to be signed by the purser and secretary. The following report, from the mining agents, was read to the meeting:—"The lode in the 80 fm. level, east of engine-shaft, is 10 in. wide, producing some tin—opening tribute ground; the lode in this level, west of said shaft, is 6 in. wide, with a little tin in it; the lode in this level, west of the flat-rod shaft, is 1 ft. wide, producing good work for tin, and rich copper ore; the lode in this level, east of said shaft, is much the same as the level before-mentioned. The lode in the 70 fm. level, east of the flookan, on Wallis's lode, is small and poor at present; we may expect such lode for several fathoms driving more, looking at the level above. To the east of this poor ground, in the 60 fm. level, we have driven through 80 fms. of good orey ground. The lode in the 60 fm. level, east of Alexander's shaft, is 1 ft. wide, producing some copper ore—opening moderate tribute ground. The lode in the 55 fm. level, west of Leed's shaft, on Wallis's lode, is 1½ ft. wide, with some tin in it—opening tribute ground; the lode in this level, west of Pollard's, on the engine lode, is 8 in. wide, producing rich stones of tin—this level is driven west of aforesaid shaft 84 fms., and has 32 fms. more to get under the new shaft; if the ground in this level should prove so favourable for driving as the ground in the level above, we may calculate on driving the 32 fathoms before-mentioned, in four months. The lode in the 40 fm. level, west of cross-cut, north of Fox's shaft, on the engine lode, is 2 ft. wide, worth 14*l.* per fm. for tin; this level, east of the said cross-cut, is small, producing some tin. We have opened in this level, east and west of the cross-cut, 26 fms. of very good tin ground, that will work at an average tribute of 4s. in the *l.* We expect to hole the new shaft to the 40 fm. level, by the middle of next week; when this is done, we intend to set the back over the level immediately, which will tend to increase our tin samplings. The branch in the 25 fm. level, east of Allen's shaft, is 3 in. wide, worth 10*l.* per fm.; this level is driven 20 fms. east of said shafts, which will average worth 10*l.* per fm. Allen's branch gradually improves in depth, so far as we have seen it. The lode in the 17 fm. level, on the south lode, east of Wheal Margaret shaft, is 20 in. wide, producing 1½ ton of copper ore per fm. The lode in the 10 fm. level, east of said shaft, is 3 ft. wide, producing three quarters of a ton of ore per fm.; in this level we have driven through a long piece of orey ground. This part of the mine has a very promising appearance indeed. The mine at present is in a good state of working; both the sumps sunk, and just commenced driving the bottom levels; the 55 fm. level, driven west of Pollard's shaft, upwards of 80 fms. towards the tin ground; the 40 fm. level cross-cut, driven and intersected the engine lode; Wheal Margaret cleared up, shafts sunk, levels extended a great length to get at the ore ground; the north adit cleared and repaired, shafts cleared up, &c., in order to work the tin ground. The afore-mentioned work done has not cost less than 850*l.*—P.S. We beg to add, according to the present appearance, the adventurers will be remunerated for their outlay."

## WHEAL TREVENNA MINING COMPANY.

A meeting of shareholders in this mine has been convened for Wednesday next, the 29th inst., to take into consideration the propriety of continuing or abandoning the further working of the mine, and of selling the materials. With the notice, has been circulated a statement of accounts, showing the existing liabilities, for surface damages and unpaid merchants' bills, 197*l.* 17s. 2d.; and arrears of calls amounting to 215*l.* 9s. The following reports have also been forwarded:—"Since our last meeting, we have sunk the shaft about 6 feet, which is now nearly 30 fms. below the adit, and driven about 7 fms. west in the 20 fm. level, without any important change in the appearance of the lode. Our object having been to sink the shaft 30 fms. below the adit, and to drive at that level, I must again strongly urge on you to prosecute this with vigour, as the mine is highly deserving of it, and we cannot expect to give any lode anything like a sufficient trial merely by sinking a shaft, unless we extend levels also. It is well known, that in driving the adit level, we had a very promising lode in different places, both east and west of the shaft, though within a few fathoms of the shaft the lode is small in the adit level, but large and promising a few fathoms below the 20, and especially so near the junction of another lode, with which it came in contact near the bottom of the shaft. It has also intersected a small elvan course below the 20, whose inclination is greater than that of the lode, and direction nearly parallel with it. These indications alone ought to encourage us to drive at this level, had there been nothing in the adit level to warrant it; and our greatest cost to prove the lode in this level is at an end. It is true, we want a small lift of pumps, the cost of which will not be more than about 25*l.*, and which will complete our machinery for drainage in this level. The cost of extending a level on the course of the lode, will be about 2*l.* per fathom."—"Agreeable to your request, I yesterday inspected Trevenna Mine, and found the adit level extended about 150 fms. on the course of the lode, and a shaft sunk about 100 fms. from its tail. There are stones of ore in the lode in several places, and a small bunch of ore 20 fms. east of the shaft, and another small bunch about 30 fms. to the west of the said shaft. The engine-shaft is sunk 30 fms. below the adit level, and the lode in and about the shaft does not appear so kindly as it does in the adit, to the east and west of the shaft. As you have the shaft now down 30 fms. under the adit level, I think it advisable to extend the bottoms, both east and west, under the shoots of ore discovered in the adit; this, I think, could be accomplished for about 25s. per share. The locality and strata appear very congenial, the lode being near the junction of granite and killas—a situation very favourable for mineral."

BOTALLACK.—At a meeting of adventurers, held at the mine, on the 14th inst., the accounts were examined and passed, showing—to balance at last account, 243*l.* 1s. 4d.; cost for July, August, and September, 1822*l.* 13s. 6d.; merchants' bills, 846*l.* 14s. 2d.—2912*l.* 11s.—By copper ores sold (less dues), 511*l.* 12s. 10d.; tin sold (less dues), 2252*l.* 11s. 2d.—2764*l.* 4s.—leaving balance against the adventurers of 148*l.* 7s.—[We have, with the last four or five statements of accounts, received no report of the state, progress, and prospects of the mine, as is the general practice. Would not a report, circulated with the statement of accounts, give more satisfaction to the out adventurers?]

CUBERT.—At the general meeting of adventurers in this mine, much discussion took place on the subject of non-payment of calls, and stringent resolutions were passed for the enforcement, as the amount was required for the effectual working of the mine, which, at the present time, holds out the most promising prospect of success.

DEVONSHIRE GREAT CONSOLS.—At an extraordinary general meeting of shareholders, held at the offices, Barge-yard Chambers, Bucklersbury, on Thursday, the 23d inst., for the purpose of electing a director, and also a trustee of the said company, in the place of William Morris, Esq., deceased.—W. A. THOMAS, Esq., in the chair.—The advertisement convening the meeting having been read, a resolution was moved, seconded, and passed, appointing Francis Morris, Esq., of Denmark-hill, Camberwell, a director, and the general trustee of the company, in the place of William Morris, Esq., deceased.

## CASCADE AND WHEAL BARRARA MINES.

SIR,—The letters of Mr. Truscott and Mr. Taunton, which appear in your paper of the 18th inst., are remarkable only for the coolness with which they persist in an untruth, and the only notice that I need take of them is, by stating that they challenge me to do a thing which they know is impossible for me to do in a public journal. Herewith I send you an advertisement, for insertion, for the sale of my shares in these mines for 35*l.*; and if any person is inclined to become a purchaser, I undertake to show a *good title*. This will be the best mode of accepting Mr. Truscott's challenge, as it will prove the truth, or falsehood, of our respective statements, to the only persons interested in the matter. The public must come to their own conclusions, as to the legitimate price of these shares.—HEINRICH FISCHER: 7, *Lincoln's Inn-fields, Dec.* 24.

## WHEAL MARTHA—"GEOLOGICUS"—CAPT. SPARGO.

SIR,—I have carefully perused Capt. Spargo's letter, which appeared in your Journal of the 4th inst., purporting to be a reply to the communication from "Geologicus." How far he has succeeded in his efforts, I will leave others to judge. I would not have troubled you with another letter on the subject of Wheal Martha, had the writer given a true description of the rock's formation, and of the mineral deposits in *this*, as well as in another mine, to which he has called my attention. Before I proceed to make a few remarks on the erroneous observations in his letter, it will not, perhaps, be amiss to inform Capt. Spargo, or rather the person who writes for him, that the person who signs "Geologicus," laboured in the bowels of the earth for a period of nearly 20 years, since which time he has been actively engaged as a principal mine agent for 12 years successively. He has examined upwards of 400 mines in and out of England, and, consequently, must, I should suppose, be a man of some little observation, and ought, at least, to have gained some knowledge on practical mining. His knowledge of the more refined, but not less useful, branches of science, intimately connected with mining, has been acquired during his agency by dint of hard labour and harder study—the rough paths having been made comparatively smooth by the kind, voluntary assistance of English, German, and French professors—gentlemen, whose names I should, if allowed, be proud to name. I merely mention these circumstances to "undeceive" Capt. Spargo, and his mining friends, "as to who and what" "Geologicus" is, and to save them the trouble of repeating their insinuations, which, being placed in italics, cannot be misunderstood. However, there is one thing he has yet to learn, and that is, the art of looking a few fathoms through the strata—from the 40 to the 80, for instance, being only 40 fms. of unexplored ground—and then taking a glance at the lode; will Capt. Spargo give him a little information on this *important* subject? We have been at no small pains in examining the geological position of the lodes at Wheal Martha, as also the rock formation contiguous to, and remote from, them—have paid particular attention to the indurated, as well as the decomposing rock—the superincumbent strata, and confused stratification—and we cannot possibly see the least indication, or anything feasible, to support his hypothesis. He says—"I must again state my firm opinion that at the depth of 80 fms. in the eastern (new mine), they will intersect a more congenial strata; and, I think, at about 100 fms. in the western mine, the same result will take place, as it appears to me, that all the present *hard* stone will be unbottomed, and the lode get in possession of its properties. Now, if Capt. Spargo had taken the trouble to examine the levels in the eastern, or new mine (which I believe he has never seen), he might have found as light blue, *soft*, and mineralised a slate, as could be seen in "Ale and Cakes," or in any other mine; but this, in my opinion, is not a favourable strata for the lodes in Wheal Martha, nor is it favourable to the precipitation of copper in various other lodes in England; and I will endeavour to prove, as briefly as possible, that the fruit of his observations, or of his practical knowledge, is not, in reality, of much value either to himself, or to those to whom he assumes to give information. The lode at Wheal Martha consists of a lamellar hornstone, the tabular structure of which dips 30 deg. 15 sec. north-west—the numerous hollows are surrounded by friable quartz, containing a decomposing iron pyrites, accompanied by a fair proportion of copper ore of good quality—whereas, the laminæ themselves are hard, containing less copper, with arsenical iron predominating. The rock on the foot wall of the lode is a compact grey slate, with a hornblende appearance: but on the north, or hanging wall, it is of a lightish blue colour, soft, and decomposing. The dip of cleavage, on both sides, is nearly parallel with the fracture of the lode. The rock on which the lode rests differs but little in appearance, or in its composition, for a great extent. Not so with the superincumbent strata, which, in some places, more particularly contiguous to the less mineralised parts of the lode, consists mostly of a talcose slate, traversed by numerous felspathic and quartzose veins, which do not, in my opinion, act as *feeders to*, but are impoverishers *of*, the lode; and had the stratum on the hanging wall been of a similar kind to that on the foot wall, more copper would, doubtless, have been found, to elucidate these remarks—the lode in one part being 10 to 12 ft. wide, orey throughout. Three samples were taken from it as follows—viz.: No. 1, near the foot wall; No. 2, from the middle of the lode; and No. 3, from near the hanging wall; they produced respectively 7½, 5, and 2½ per cent. of copper.

The ore in that part of the lode from which the No. 3 sample was taken was in a high state of decomposition; the waters containing a proportion of copper carries it through the softer rock, which is evident from the sulphate and arseniate of copper precipitated in many parts of it, at a considerable distance from the lode. Again, in the old mine, the most productive part of the lode produced thousands of tons of ore during the last working. The rock on both sides of this regular shoot consists of a compact grey slate; but where the light blue soft slate made its appearance, the lode has been found unproductive.

Captain S. goes on to say:—"Between *the two lodes*, in the 40 fm. level (alluding to the old mine), north of the south lode, there is a clay-slate, which is not congenial for copper; and the strata to the north of the north lode, for upwards of half a mile, is a dark blue (grey) strata, more congenial for *lead* than copper." The two lodes he mentions is *the* lode, divided into two or more parts, near the division of which *a* lead lode traverses the dark *blue* slate, which has been wrought on, northerly, for upwards of 90 fms., and a few cwts. of lead only raised from the explorations. There is, in my opinion, more importance attached to the stratified and unstratified rocks, through which mineral veins traverse, than is absolutely necessary—while the nature and composition of lodes, which are often overlooked, should require greater attention. With respect to the similarity of lodes, what have the lodes in the "All and Cakes" to do with those in the mine in question? There is not the least similarity between them. Or what analogy is there betwixt the elvan courses there and Wheal Martha, in which there is *no* elvan cross-course?—None whatever. The only lode that I have seen of similar constituents, is that of the Great Wheal Friendship, near Tavistock—a lode traversing a dark blue hard slate, which was considered, by several experienced mine agents, to be exceedingly unfavourable for copper ore, and hence a recommendation to abandon the workings was given; but the results of a subsequent development have clearly proved, that they were wrong in their suppositions; and it also shows (for Wheal Friendship has been one of the richest and most profitable mines in Devonshire), that a light blue slate is not favourable for mineral deposits in every mining locality. Relative to Capt. Spargo's observations in Holmbush, I have inspected this mine more than once, and was never fortunate enough to see an elvan cross-course in it, much less an elvan *deposit*. The small veins intersecting the lode at right angles are not porphyritic, nor have they had the effect of enriching the lode, because they are numerous in those parts where the lode is entirely worthless. It is also evident that the bed of hornblende rock has had no better effect; for it extends west of the lead course, where Capt. Spargo admits "the lode *refused* to produce copper." However, in this part of the mine, he says:—"But, as they proceeded west, within a few fathoms of the great cross course, the ground began to be somewhat disordered, and was frequently found to produce soft portions of decomposed granite, and the clay-slate, of a *dark hue*, with small portions of *carbonate of lime*, more congenial for lead than copper." I do not exactly understand whether Capt. S. means that the "dark hue slate," or that carbonate of lime, is more congenial for lead. The deposits of lead in this mine have been discovered in the vicinity of, and accompanied by, a light blue soft talcose slate, whereas the lode in the *dark hue slate* has produced no lead worthy of notice. Carbonate of lime does not, I believe, exist in this mine, and what mineral he calls *lime* I am at a loss to name. I would recommend him to devote a portion of his time to the study of those branches of science essential to mining, before he again assumes to give information on subjects of which he knows nothing; and when he is capable of confuting my arguments, let him do so in his own words, and not lead

his name to the writings of others. The concluding part of his letter is not the language of Capt. Spargo—his capabilities in this respect are well known to—GEOLOGICUS: *Dec.* 15.

## THE MINING INTEREST.

We have received the following statement of the annual produce of the various minerals, for which we return thanks, declining, at the same time, to vouch for their correctness—viz.:—

| | |
|---|---|
| Coal | £25,000,000 |
| Iron | 8,000,000 |
| Tin | 315,000 |
| Copper | 1,406,000 |
| Lead | 1,000,000 |
| Salt | 400,000 |
| Total | £36,121,000 |

The number of persons employed in supplying coal from the mines to our cellars, is 118,233, which is more than a third of those who (according to the official census) are employed in the entire cotton manufacture.

## MINING NOTABILIA.

[EXTRACTS FROM OUR CORRESPONDENCE.]

PLYMOUTH WHEAL YEOLAND.—The new south lode is looking exceedingly well—the men are now raising large quantities of ore at 3 ft. under the surface; the boiler arrived at the mine on Wednesday, and we expect to be in full work about the latter end of January.

SOUTH WHEAL BETSY (near Tavistock, Devon).—A new mine has been opened under this title, immediately east of the Great Wheal Friendship. It is a mine of great promise. The sett has been taken by Mr. Fred. S. Thomas, and a few others, and all the disposable shares have already been sold at 2*l.* 10*s.* per share—the amount of purchase money being paid in to form the capital for working the mine. The mine will be worked by adits only to the depth of 60 fms. The capital stocked will pay costs for six or seven months; and it is confidently calculated, that lead ores will be in the market, and dividends made in about three months from the present time. This is a praiseworthy arrangement, and the consequence has been already felt, in a demand for the shares at a premium.

WEST WHEAL MARIA.—I beg to inform you, that the lode in the eastern engine-shaft is, without important alteration, 3½ ft. wide, producing good stones of ore. In the cross-cut south, in the 54 fm. level, the ground is much the same for driving as last week, rather hard.

EAST POOL.—At a meeting of adventurers, held at the mine, on the 21st inst., the accounts were examined and passed—showing labour cost for Oct. and Nov., 419*l.* 15*s.*; tribute, 213*l.* 18*s.*; merchants' bills, 198*l.* 0*s.* 5*s.*=831*l.* 13*s.* 5*d.*—By ores sold (less dues), 557*l.* 0*s.* 11*d.*; drainage, tribute, and material, 133*l.* 5*s.* 8*d*=690*l.* 16*s.* 7*d.*—leaving loss, 140*l.* 16*s.* 10*d.*, to which add ditto of last account, 494*l.* 9*s.* 3*d.*; making balance against mine, 635*l.* 6*s.* 1*d.*

WHEAL MARGARET.—At a quarterly meeting of adventurers, held at the mine, on the 21st inst., the accounts, to Sept. last, were examined and passed, showing—Labour cost, 208*l.* 11*s.* 1*d.*; coals, 109*l.* 10*s.* 9*d.*; merchants' bills, 48*7l.* 4*s.* 9*d.*; lords' dues, 21*0l.* 3*s.* 6*d.*; machinery, 450*l.*=334*l.* 9*s.* 2*d.*—By tin sold, 519*5l.* 18*s.* 10*d.*; sundries, 8*l.* 8*s.*=520*4l.* 1*s.* 10*d.*: leaving balance in favour of adventurers of 186*2l.* 12*s.* 8*d.*; to which add balance end of June, 336*l.* 0*s.* 10*d.*, leaves an available sum of 2198*l.* 13*s.* 6*d.*, from which deduct dividend of 10*l.* per 112th share=1120*l.*: leaves a balance of 1078*l.* 18*s.* 6*d.*

CARWINNING HILL COPPER MINE.—The situation of this mine is on the north of the railway from Glasgow and Ayr, and is east from Dalry about three miles, whence, and from the railway, the ground rises gradually to Carwinning Hill. The mine was opened about half-way up the hill, where the first level is now being driven below such first opening, and in which a highly promising vein has been discovered, 3 ft. 6 in. wide, containing some excellent copper stones. In driving this level, a very fine gossan has been cut, the water issuing from which is strongly impregnated with copper. The indications of a rich deposit of ore are so well defined in this level, that the most experienced miners consider it almost a certain operation. When this level has been driven 10 or 12 fathoms more, it is expected they will raise from the mine a very considerable quantity of copper. The cross veins are all of the same metalliferous character, although they do not show so large a proportion of copper as the main lode, which has been reached by a shaft (which was sunk near the first opening)—in cutting into which some very fine argentiferous copper ore has been discovered, the analysis of which gives—copper, 64 per cent.; silver, 70 ozs. to the ton. From the dip of the lode, as also the lateral cross veins, a general opinion has been formed that the *ïoss* of this hill forms a cap, somewhat resembling an inverted cone; and that the cross lodes, and other small veins, are branches, running into our main trunk a few fathoms below. From reports, recently received, it appears the ground has been opened higher up the hill; and in which opening a lode of solid grey ore, of the same rich quality, has been found, 6 in. in thickness. By the same report, we learn, that copper ore is now being housed for dressing, preparatory to sale.

RADCLYFFE COLLIERY, NORTHUMBERLAND.—A writ of inquiry was entered into, at the Secondaries' Court, on Wednesday last, to assess damages in an action for a breach of covenant. The principal facts were these:—The parties in the suit were proprietors of the Radclyffe Colliery, having for partners besides, Lord Newburgh, Sir J. Rennie, and Sir H. Webb. A considerable sum of money was spent in improving the Harbour of Warkworth, from which the coals were to be exported; and, subsequently, Mr. Browne (the defendant, and then manager of the colliery) purchased on behalf of the company, but in his own name, seven vessels, to carry the coals from Warkworth to London; and he entered into a covenant with Mr. Molloy, the plaintiff, as trustee for his copartners, that these vessels should be used and worked only for the use of the company, in carrying coals, at a freightage of 8*s.* per ton. It appeared, however, that these vessels were used for other purposes by Mr. Browne, against the terms of the covenant, and by which the company was alleged to have sustained losses—as they had to employ other vessels to export their coals, and had to pay them higher rates of freightage. Judgment having been allowed by default, the breach was admitted, and the only question was one of damages. It was shown, that with these vessels the defendant had shipped coals to Malta, Russia, Prussia, and Naples, on his own account, and traded with return cargoes from these ports. Evidence was gone into, when Mr. Whitfield, the clerk of the company, proved the facts of the case; as also, that while the defendant was employing the ships elsewhere, the company were losing, by not being enabled to procure shipping for their trade, and actually suffered for a breach of contract in not fulfilling an order to supply coals at Havre. The learned Secondary, Potter, entered very minutely into all the circumstances of the case, when the jury assessed the damages at 491*l.* 8*s.*—averaging the loss of the plaintiffs at 1*s.* per ton on the freightage paid to strangers, over that which they would have had to pay to Mr. Browne, according to agreement.

ASSOCIATION FOR THE PROTECTION OF MINING PROPERTY.—On Wednesday, the 8th inst., a number of the principal mining proprietors in the western part of this county met at Andrew's Hotel, Redruth—W. WILLIAMS, Esq., in the chair—for the purpose of considering the best means of protecting the property of the various mines with which they are connected, and for detecting and punishing the stealers of such property. The meeting resolved to impress on all constables and police officers acting under the authority of the magistrates, the necessity of frequently visiting the premises of marine store dealers to make strict examination of their stores, and of the entries in their books. It was also resolved to employ four policemen to visit the different mines as often as possible, and obtain information respecting missing property; and that the police should go frequently at night through the mining districts with which the association is connected, to report all circumstances of a suspicious nature to the mine agents concerned in such cases. As a further means of preventing the plunder of mines, the meeting determined not to buy from any founder or other person who may purchase brass, iron, or other mining materials from any parties but the agents of the mines, or other responsible persons. The salaries of the policemen, and all expenses incurred in apprehending and prosecuting parties, it was resolved should be paid by the different mines subscribing to the association in proportion to the gross returns in money of each, for six months, ending November last. Mr. William Williams was requested to act as treasurer, and Mr. Richard Davey as secretary of the association. The resolutions agreed to were sent to each mine in the parishes of Gwennap, Redruth, St. Agnes, Illogan, Camborne, Kenwyn, and Perranzabuloe, with a request that each mine should send a representative to the meeting at Andrew's Hotel, on Wednesday next, to be held for ascertaining the number of mines that will subscribe to the purposes of the association.

BIRMINGHAM AND OXFORD RAILWAY.—In the Secondaries' Court, on Wednesday, the case of Peto and another *v.* the Birmingham and Oxford Railway Company, was tried. This was an action on covenant. The plaintiffs are the well-known contractors. The learned counsel for the plaintiffs said, the claim was for 21,600*l.*, for work and labour performed on the Birmingham and Oxford line of railway. By a covenant entered into by the company, they undertook to pay the amount of the plaintiff's account fortnightly, on production of a certificate from Mr. Brunel, that the work had been properly performed. One month's money was, however, still due; but all difficulties, in the way of ascertaining the amount was removed, as the defendants had admitted, under a judge's order, that they had entered into the covenant stated in the declaration, and that the certificates had been duly delivered, showing that the work was of the value charged for. The learned secondary thought it would be more satisfactory to put the covenant in evidence, and the jury could give a verdict by default. This was done, and a verdict given for the above amount.

## DECIMAL COINAGE—EASY RULE FOR REDUCING, &c.

Professor De Morgan, in a valuable paper in the *Compendium to the British Almanack*, for 1841, called the attention of the public to the advantages of a decimal coinage; and in the *Compendium* to the Almanack for 1848, he again reverts to this important subject in a manner still more copiously. Public opinion has now been fairly enlisted in favour of the addition of decimal pieces of money to those of our present coinage. In fact, it is only an addition to, and not a change of, our coinage that at present is necessary.

Mr. De Morgan professes not to enter fully into the almost innumerable advantages which a decimal system would give us in all our money calculations. He avers, that these advantages are now *never disputed*, yet he admits that they are not always fully seen. To enter into an examination of the many advantages of this system, would indeed occupy too much of your very valuable space. Let it here suffice, to remind your readers that a Government commission (who reported in December, 1841) recommended, in strong language, that the Government of this country should, at an early day, introduce the decimal system of coinage.

The plan simply is this:—The *pound* is to remain the standard, and to be coined into 1000 farthings, instead of 960. The tenth of the pound will, therefore, be 100 of these farthings, or 2*s.*; and the tenth of 2*s.* will be a 10 farthings-piece; and the farthing will be the 10th of the last coin. We have, therefore, *tens, hundreds, thousands*, as in common arithmetic; and the new coins should have names expressive of their relative value.

They may be called—A *decem*, a 10th, or a *decimal*; a *centem*, a 100th, or a *centimal*; and a *millem*, or 1000th, or a *millimal*. The roots of these terms are so naturalised into our language, as to be almost English. They are highly expressive of their respective values, and foreigners would as easily recognise their names as ourselves. The giving unmeaning arbitrary names to new coins, in these business and practical days, would be nothing less than an act of *barbarism* indeed.

We have had many *rules* given us for converting our present money into the decimal of the pound, and, on the contrary, the decimal of the pound into our present money. Let me suggest the following, as easily remembered. I have been constantly in the custom of using it, but I do not remember seeing it in any work.

*To Reduce Shillings, Pence, and Farthings to the New Coins; or, in other words, to the Decimal of the Pound, having three decimal places only:—*

RULE.—Use two multipliers only—4 and 5.

Multiply the pence by the 4, and add the farthings, and then multiply the shillings by the 5, and add what may be carried from the pence.

After a little practice, this rule can be worked mentally with great facility.

Reduce 16*s.* 4½*d.* to decimals.

Then the decimal of 16*s.* × 5, and the decimal of 4½*d.* × 4 = 0·818.

Reduce 19*s.* 5½*d.* to decimals.

The decimal of 19*s.* × 5, and the decimal of 5½*d.* × 4 = 0·971.

*To Reduce the New Coins (or the decimal of the pound) into Shillings, Pence, and Farthings —the decimals having three places only:—*

RULE.—Use two divisors, 5 and 4.

Divide the first two decimals by 5 for shillings, and the third by 4 (with what remainder there may be from the first division), for pence and farthings.

Reduce £0·818 to shillings, pence, and farthings.

·81 ÷ 5, and 8 ÷ 4 = 16*s.* 4½*d.*

Reduce £0·971 to shillings, pence, and farthings.

·97 ÷ 5, and 1 ÷ 4 = 19*s.* 5½*d.*

*Note.*—That, as every 6*d.* in the old farthings has 24, and as, in the new ones, it has 25—therefore, when you *multiply* (to reduce old coins into new), you must *add* one for the 6*d.*; and, when you *divide* (to reduce new coins into old), you must *take off* one for the 6*d.*

Reduce 10*s.* 6½*d.* to decimals.—10 × 5, and 6½ × 4 + 1 = ·527.

Reduce £·527 to present money.—·52 ÷ 5, and 7 ÷ 4 — 1 = 10*s.* 6½*d.*

For all practical money exchangers, three decimals will be found sufficient. A very simple rule, however, will afford decimals of 4, 8, 6, &c., places—not necessary to be explained here.—J—N M——S: *Battersea, Dec.* 21.

AYRSHIRE IRON COMPANY.—A special meeting of this company was held, on Wednesday last, at the Black Bull Inn, Glasgow, to consider the present state of the company's affairs.—JAMES WATSON, Esq., was called to the chair.—A report of the affairs of the company, prepared by Mr. M'Clelland, accountant, was read to the meeting, from which it appeared that the total debts due by the company amounted to 236,719*l.* 14*s.*, of which 15,000*l.* were due on account of the recent speculations of the company in extensive malleable iron-works. The assets of the company were estimated in all at 155,872*l.*, leaving a deficiency of 80,847. Of this, the sum of 72,518*l.* is a debt due by the Blair Iron Company—two of the directors of which (Mr. Alison and Mr. Hamilton) were also directors of the Ayrshire Company; and, from the other proceedings, it appears that both of these gentlemen have stopped payment.—Mr. HENRY said, there had been 10,000*l.* put down as paid to the Blair Iron Company, for the royalty of Pitcon, and, at the same time, that 4000*l.* had been over-paid at the pits at Pitcon, without stating whether the royalties which were overdrawn were payable to the partners of the Blair Iron Company, or to Mr. Alison, an individual partner.—Mr. M'CLELLAND said, the whole of the lordship due to the Pitcon estate had been carried to the debit of the Pitcon pits, and thereby found its way into the pockets of the proprietor. The 10,000*l.* was over and above what had been paid, and was a wrong entry.—A private meeting of the shareholders was afterwards held, at which it was agreed, that the shareholders should subscribe a certain sum, in order to raise sufficient to pay the creditors the sum of 10*s.* in the pound by the 15th of January next to meet which about 100,000*l.* has since been raised by subscription.—The difficulties of the company appear mainly to have been occasioned by the purchase of the stock of the Blair Iron Company, absurdly valued at 200,000*l.*, to liquidate which, iron had been purchased on credit, sold for cash, and the proceeds paid to the Blair Company. The Ayrshire has claims against the latter for over-payment, which are to be demanded of its solvent partners. No failures of Glasgow shareholders have yet taken place, and, at the meeting, shareholders were urged not to allow themselves to become insolvent, as the company could prefer claims, that would carry off seven-eighths of their estates, and so leave nothing to private creditors. The creditors of the company, on being made acquainted with the intentions of the shareholders, expressed themselves as being satisfied with them. In Edinburgh, the caution to avoid the *Gazette* has been made too late, as several shareholders there have been declared insolvent. Other failures have also taken place, and more are expected amongst writers to the signet, accountants, &c., extensively employed as agents for landed proprietors, who have been in the habit of borrowing for, or lending to, their clients. These casualties fell directly on shopkeepers and tradesmen, and have caused a stagnation and distrust, exceeding even the panic of 1826.—After the official meeting, the parties present resolved themselves into a private meeting of shareholders, when the following important resolution was passed:—"That it be ascertained what money is required immediately; that all the shareholders be immediately compelled to bring their payments up to 10*l.* per share; and that the balance raised, at the same time, be so much per cent. over the whole stock of the company."

THE COAL AND IRON TRADES.—The following letter, signed "A Manufacturer," appears in the *Birmingham Journal*, of yesterday:—"It appears to be general, throughout the coal and iron districts, that a reduction of 20 per cent. upon labour is about to take place. I, myself, as a manufacturer, rejoice in that reduction, not only for my own interest but that of my neighbours, inasmuch as I feel convinced that both master and man will be benefited by such a course, more particularly if they share the same fate in the reduction—20 per cent. off the master, and the same off the man, will take 40 per cent. off one ton of iron, and will, therefore, reduce bar-iron from 10*l.* to 6*l.* per ton, and best coal from 12*s.* to 8*s.*, and common coal from 10*s.* to 6*s.*; all prices below that having disappeared since the extraordinary high prices have been charged, all slack and coals are charged the same. I, myself, am very sorry to say that the coalmasters have for a long time been plundering the public, if the royalty masters have been clearing 6*s.* a ton upon all best coal, and 5*s.* a ton upon common, which has been currently reported. I have daily conversation with operatives connected with the coal and iron trades, and the generality of them would, I think, be perfectly satisfied with the reduction before-named, which would, in some measure, enable us to compete with foreigners in making iron, and very likely enable us to supply our old market, America, and not allow the Yankees a chance of supplying our home trade. This, I consider, ought to be study of every man in the iron district—South Staffordshire, in particular—that the foreign markets must ultimately be our resource; on completing railway orders, which cannot last long, the stagnation in trade, which the suspension of railway proceedings for a time has caused, ought to be sufficient proof. I consider that a more active competition was never more likely to take place than at the present time between the foreign and South Staffordshire manufactures; the latter place, being so far inland, will, I fear get the worst of it, unless wages, coal, iron, freight, provisions, and rent, are very much reduced; then the workmen would be better off, which they themselves acknowledge, and would very materially benefit the masters."

THE NEW IRON STEAM-SHIP "CUMBERLAND."—This fine vessel, which has been built for the Carlisle and Liverpool Steam Navigation Company, arrived at Port Carlisle, under the command of Captain Burton, at the early part of this month. She is built entirely of iron, divided into five water-tight compartments, so that an accident in any one part of the ship produces little or no effect upon any other part. She measures, from stem to stern, 210 feet, her breadth of beam is 25 ft., and depth of hold 13 ft. 3 in. Her poop or quarter-deck is 60 ft. in length—thus affording ample space for promenading, or even for dancing, to those who love the gentle exercise, for cabin passengers. Six convenient and well-protected horse-stalls are fitted up on deck, and it is calculated that there is room for the conveyance of 1000 sheep. She is propelled by two engines of 150-horse power each, constructed on the oscillating principle. Her accommodation for deck passengers are admirably contrived. On deck they are well protected by high bulwarks; and below they have comfortable cabins fitted up with every requisite convenience, and with the proper means of separating the men from the women. The cabin is of most easy access, the companion being roomy and beautifully ornamented. The saloon is a most elegant apartment—large in dimensions, and beautifully fitted up. The cushions of the sofas and chairs are of crimson plush, and present a most elegant appearance. The sides of the saloon are divided into panels, each containing an exquisite view of some interesting scene in "Canny Cumberland." The sleeping cabins are admirably arranged, and fitted up with every attention to the combination of convenience and elegance.—*Liverpool Mercury.*

## Current Prices of Stocks, Shares, & Metals.

*STOCK EXCHANGE, Saturday morning, Eleven o'clock.*

| | |
|---|---|
| Bank Stock, 9 per Cent., 188 | Belgian Bonds, 4½ per Cent., — |
| 3 per Cent. Reduced Ann., 85 4¼ | Dutch, 2½ per Cent., 56¼ 6 |
| 3 per Cent. Consols Ann., 85¼ | Brazilian, 5 per Cents., 79 80 |
| 3 per Cent. Annuities, — | Chilian, 6 per Cents., 88 |
| 3½ per Cent. Ann., 96½ ¾ ¼ | Mexican, 5 per Cents., 19 |
| Long Annuities, 8¼ | Spanish, 5 per Cents., 18 ⅜ |
| India Stock, 10½ per Cent., — | Ditto 3 per Cents., 30½ |
| 3 per Cent. Consols for Opg, 85¼ | Portuguese, 4 per Cents., 22½ |
| Exchequer Bills, 1000*l.* 3*d.*, 9 12 pm. | Russian, 5 per Cents., 107 |

MINES.—The amount of business transacted in the mining market *this* week has been rather important, inasmuch that a large number of shares have been done, independent of the private negociations which we anticipated would have come off. Taking the gross amount done, it will be found beyond the usual weekly average, and amply supply the deficiency of last week.

The inquiries for shares in established and prosperous mines continue, and we feel more convinced that the capitalist perceives a more secure and profitable investment for his property than in many other kinds of speculative engagements, which having been tested by the late severe monetary crisis, proved so very fallacious and delusive. We, therefore, trust that the present movement is the harbinger of that confidence which we, a short time since, predicted as likely to attend the commencement of the new year.

We notice that several new mines, of much promise, are about being brought before the public; and, as the ability and practical experience of the projectors have not confined themselves to any particular locality, but, after investigating the metalliferous districts of the United Kingdom, will, we believe, open a vast and important field for the employment of disengaged capital; and thus extend the mining interests of our native land. At the same time, we would recommend an exercise of that precaution which is absolutely necessary to avoid the snares laid for the unadvised and too confiding; and, for their guidance, would refer our friends to the perusal of a well-designed and elaborate paper, headed "Mining during the Year," which we purpose publishing next week, and intended as a beacon against illegitimate and dishonourable mining speculations.

Referring to the transactions of the week, we find that a number of shares in Devon Great Consols have changed hands—the reports from the mines are highly satisfactory. The great improvement in Plymouth Wheal Yeoland has created a demand and rise in price.

On the 14th inst., the directors of Carn Brea Mining Company declared a dividend of 2*l.* per 1000th share, from the profits of the past month, making 20,000*l.* paid during the present year. The shares, according to our present quotation, will give about 20 per cent. per annum.

Wheal Seton meeting, held on the 14th, gave a dividend of 20*l.* per 99th share, reserving a balance of 2400*l.* in the hands of the purser. The present position of this mine is admirable; and, from the extent of ground developed, we may consider her only in a state of infancy. The report, furnished by the agents at the meeting, fairly encourages us to calculate on a considerable increase in the returns, before the expiration of 1848.

Wheal Trehane bi-monthly meeting was held on the 17th, when a dividend of 20*s.* per 256th share was declared, being the fifth made during the year; the balance in hand, after payment of the dividend, is about 450*l.* The agent's report is highly satisfactory.

In the foreign mines, the transactions appear to have been confined to but a few mines—viz.: St. John Del Rey, Barossa Range, and Australians. With respect to the latter we find, that during the early part of the week, a dividend was created for these shares, when they advanced from a discount to 1¼ or 1⅜ premium; but since a reaction has taken place, and they remain stationary at our present quotations. The rise, we understand, was occasioned by the accounts received by private letters from the mines. Extracts from the official reports may be seen in another column.

Despatches have been received from South Australia, by the Scottish Investment Company, furnishing the most satisfactory information relative to their mining property of Bon Accord, adjoining the celebrated mine of Burra Burra. The North British Australasian shares (which company holds a large number of shares in the Bon Accord, as well as in the mines in the Island of Kawaw, New Zealand), have advanced in consequence. Some particulars, relative to the latter mine, will be found in another column of this day's Journal.

Since our last, we find the following arrivals with specie, *ex Wilberforce*, from Hamburgh, with 14,000*l.* value; *ex Ocean*, from Rotterdam, only 1000*l.*; *ex Princess Royal*, from Hamburgh, 7000*l.*

RAILWAYS.—At the commencement of the week, the share market was exceedingly heavy, owing most probably to the heavy calls falling due next month; and the dullness of the funds had a depressing effect on prices. On Wednesday and Thursday, prices were still on the decline, with a slight improvement; towards the afternoon they drooped again, and left off yesterday in the usually depressed state.

HULL, THURSDAY.—We have to record another week of depression in the share market. Certain stocks are, indeed, now as low as they have been for the last six months. The packed committee on the currency question, and the very inadequate measures taken for the alleviation of railway calls, we consider the chief reason of the present lithargic state of the market. The calls on new lines ought to have been spread over a period of, at least, five years, with power to the "proprietors," at public meetings, to sanction more speedy payments, if found really necessary and desirable.

### RAILWAY TRAFFIC RETURNS.

| Name of Railway. | Lgth. Rway. | Present actual cost. | Price per share | Last Div. | *Traffic Returns.* 1847 | 1846 |
|---|---|---|---|---|---|---|
| Arbroath and Forfar | 15 | £179,939 | 26 | 4 *p.c.* | £ 115 | 137 |
| Chester and Birkenhead | 15 | 706,793 | 38 | — | 552 | 482 |
| Dublin and Drogheda | 35 | 733,655 | 53½ | 3½ | 704 | 630 |
| Dublin and Kingstown | 7¾ | 472,282 | — | 7 | 502 | 550 |
| Dundee, Perth, and Aberdeen | 39½ | 285,745 | 35 | 6 | 727 | 216 |
| East Lancashire | 24 | 1,207,490 | 21 | — | 805 | 546 |
| Eastern Counties | 202½ | 7,698,370 | 15¾ | 5 | 11143 | 9005 |
| Eastern Union | 43¼ | 979,926 | 60 | — | 1119 | 405 |
| Edinburgh and Glasgow | 50 | 2,375,745 | 43¼ | 6 | 3082 | 2927 |
| Edinburgh and Northern | 29 | 953,207 | 16¾ | — | 537 | — |
| Glasgow, Paisley, and Ayr | 60¼ | 1,890,547 | 121 | 7 | 2104 | 2073 |
| Glasgow, Paisley, & Greenock | 23 | 638,964 | 18¼ | 3 | 865 | 825 |
| Gt. Southern & Western, Ireland | 110½ | 1,876,326 | 22¾ | — | 1629 | 952 |
| Great Western | 240¾ | 10,630,763 | 94 | 8 | 18006 | 16931 |
| Kendal and Windermere | 10½ | 147,001 | 23 | — | 77 | — |
| Lancaster and Carlisle | 70 | 1,291,913 | 34 | — | 1014 | — |
| Lancashire and Yorkshire | 92½ | 6,807,314 | 76 | 7 | 7969 | 7928 |
| London and North Western | 428 | 20,010,467 | 148¾ | 9 | 36697 | 35582 |
| London and Blackwall | 4 | 1,146,289 | 4¼ | ¾ | 737 | 659 |
| London, Brighton, & South Coast | 147 | 5,659,180 | 42¼ | 4 | 7118 | 6054 |
| London and South-Western | 186 | 5,836,132 | 30 | 9 | 7369 | 5193 |
| Londonderry and Enniskillen | 14¼ | 160,013 | 24¾ | — | — | — |
| Manchester, Sheffield, & Lincolnsh. | 49¼ | 2,078,135 | 50 | 5 | 1878 | 1643 |
| Maryport and Carlisle | 28 | 424,417 | — | 3 | 532 | 454 |
| Midland Company | 382 | 8,658,604 | 107 | 7 | 18552 | 16636 |
| Midland Great Western (Irish) | 20¼ | 583,776 | — | — | 901 | — |
| Newcastle and Carlisle | 65 | 1,184,080 | 117 | 6 | 1948 | 1795 |
| Norfolk | 70¼ | 1,375,633 | 77 | 6 | 2005 | 1193 |
| North British | 78 | 2,514,150 | 25¾ | 5 | 1783 | 1090 |
| Shrewsbury and Chester | 17 | 591,158 | 21¾ | — | 513 | 228 |
| South Devon | 29 | 1,339,860 | 24 | — | 672 | 326 |
| South-Eastern | 157¼ | 6,398,218 | 30 | 6 | 7748 | 6502 |
| Taff Vale | 38 | 786,607 | — | 5¼ | 1686 | 1237 |
| Ulster | 25 | 646,211 | 52 | 6 | — | 680 |
| Whitehaven Junction | 12 | 130,000 | — | 4½ | 172 | — |
| York, Newcastle, & Berwick | 236¼ | 3,685,102 | 33 | 9 | 10887 | 3003 |
| York and North Midland | 196 | 3,196,869 | 72 | 10 | 7149 | 5142 |
| **FOREIGN RAILWAYS.** | | | | | | |
| Amiens to Abbeville | 28 | 573,338 | — | 4 | 1107 | — |
| Antwerp to Ghent (three weeks) | 31 | — | — | — | 1313 | — |
| Belgian | — | — | — | — | 64135 | 60670 |
| Dutch Rhenish | 57½ | — | 2¾ | — | — | — |
| Northern of France | 211 | 2,000,000 | 11¾ | 4 | 13010 | 7881 |
| Orleans to Bourges (Central) | 70 | — | — | — | 2743 | — |
| Orleans to Tours | 72 | 600,000 | — | 5 | 3656 | 2472 |
| Paris and Orleans | 82 | 2,011,720 | 46¾ | 12½ | 8348 | 6957 |
| Paris and Rouen | 85 | 2,092,916 | 34¾ | 9½ | 5760 | 5225 |
| Rouen and Havre | 50½ | — | 19 | 4 | 2082 | — |
| Strasburgh and Basle (monthly) | 88 | — | 8 | 1½ | 9080 | 10227 |
| West Flanders (ditto) | — | — | 1¾ | — | 1615 | — |

Total earnings for last week, £150,906, being an increase of £17,871 over last year.

EXPORTATION OF THE PRECIOUS METALS.—The following are the official return of the exports of gold and silver from the port of London for the last week:—

Silver coin to Belgium ..... 5,900 ounces.

### CURRENT PRICE OF GOLD AND SILVER.

| | | | |
|---|---|---|---|
| Foreign gold, in bars ....per oz. | £3 17 9 | New dollars.....per oz. | £0 4 9½ |
| „ Portugal pieces.... | 0 0 0 | Silver in bars (standard) .... | 0 4 11½ |

## LATEST CURRENT PRICES OF METALS.

*LONDON, DECEMBER 24, 1847.*

| | £ s. £ s. d. | | £ s. £ s. d. |
|---|---|---|---|
| Iron—Bar &c., Wales..ton | 7 10— 7 15 0 | Copper—Ord. bottoms .. | 0 0— 0 0 12 |
| ,, ..London .. | 0 0— 8 15 0 | Yellow Metal Sheathing | 0 0— 0 0 9½ |
| Nail rods ,, .... | 9 5— 9 10 0 | Tin—Com. blocks g..cwt. | 0 0— 4 2 0 |
| Hoop (Staf.) ,, .... | 11 0—11 10 0 | ,, bars ........ | 0 0— 4 3 0 |
| Sheet ,, ,, .... | 0 0—12 0 0 | Refined ........ | 0 0— 4 6 0 |
| Bars ,, ,, .... | 0 0—10 5 0 | Straits h ........ | 4 0— 4 1 0 |
| Welsh cold-blast foundry pig .. | 4 0— 5 0 0 | Banca ........ | 0 0— 4 4 0 |
| Scotch pig b, Clyde | 2 6— 2 8 0 | Tin-Plates—Ch., IC i, box | 1 8— 1 10 0 |
| Rails, average .... | 8 0— 8 10 0 | ,, IX ... | 1 14— 1 16 0 |
| Chairs ........... | 0 0 — 4 17 6 | Coke, IC | 1 3— 1 4 0 |
| Russian, CCND c.. | 0 0— —— | ,, IX ........ | 1 9— 1 10 0 |
| ,, PSI .... | 0 0— —— | Lead—Sheet k ......ton | 0 0—19 0 0 |
| ,, Gourieff | 0 0— —— | Pig, refined ....... | 0 0—19 10 0 |
| ,, Archangel | 0 0—12 10 0 | ,, common .... | 0 0—17 10 0 |
| Swedish d, on the spot | 0 0—11 5 0 | ,, Spanish, in bd. | 0 0—17 0 0 |
| ,, Steel, fagt. | 0 0—16 0 0 | Red.......... | 0 0—19 10 0 |
| ,, ,, kegs | 0 0—14 0 0 | Dry White........ | 0 0—24 0 0 |
| Copper—Tile f ........ | 0 0—97 0 0 | Shot (Patent)..... | 0 0—20 10 0 |
| Tough cake ..... | 0 0—98 0 0 | Spelter—(Cake) l on spot | 19 10—20 0 0 |
| Best selected ..... | 0 0 101 0 0 | ,, for arrival .... | 19 0—19 10 0 |
| Ordin. sheets, lb... | 0 0— 0 0 11 | Zinc—(Sheet) m export.* | 0 0— 27 0 0 |
| | | Quicksilver n ......lb. | 0 0— 0 4 6 |

a Discount 2½ per cent. b Net cash. c Discount 2½ per cent. d Ditto e In kegs ½ and ⅝-inch. f Discount 3 per cent. g Ditto 2½ per cent. h Net cash in bond. i Discount 3 per cent. k Ditto 2½ per cent. l Net cash. m Discount 1½ per cent. n Discount 1½ per cent. * For home use it is 32l. per ton.

[FROM OUR CORRESPONDENTS.]

Iron, of all descriptions, remains very dull, and, unless demand improve, prices are likely to be lower.—Copper continues in fair request.

Tin.—The demand for English remains good, and stock is still low; in foreign very little doing, and prices almost nominal.

Tin-Plates and Lead.—There is not much doing in either.

Spelter is firmer, owing to the frost having set in at Hamburgh, with an unusually small stock here. In the early part of the week, sales were made at 19l.; since then 19l. 10s. has been paid; and although a small quantity might still be got at this price, the chief holders ask 20l.

Prices of iron, as well as of other metals, are, in a great measure, nominal.

### THE IRON TRADE.

GLASGOW, Dec. 23.—The market for pig-iron still continues heavy, and prices drooping. There have been some forced sales made, for immediate cash, and 45s. to 45s. 6d. is all that it could command. The price for cash against bill of lading is without much change, and may be quoted at 47s. to 47s. 6d., for mixed Nos.

BIRMINGHAM, Dec. 23.—A meeting of the creditors of Messrs. Oakes and Jones, of the Ketley Works, near Kingswinford, and whose embarrassments have been already adverted to, was held at Dee's Royal Hotel to-day. The attendance of creditors was numerous. The liabilities of the concern (exclusive of debts secured by mortgage) were declared to be about 20,000l. There was an unanimous expression of good feeling for Messrs. Oakes and Co., and of confidence in their honour and integrity; and after the state of the affairs of the concern had been fully discussed—it appearing that if time were given the debts might be discharged in full—it was resolved to accept an instalment of 6s. 8d. in the pound, payable in January, 1849, and further instalments of 3s. 8d. in the pound every six months, until the debts are fully liquidated—thus finally winding up the affair three years hence. The concern will hereafter be carried on under the inspection of Messrs. Charles Shaw, of Birmingham; R. Smith, of Dudley; and Williamson, of the Potteries.—The adjourned meeting of creditors of the Oak Farm Estate, to have been held to-day, has been further adjourned until the 3d of January—it having been found impossible to obtain a full inventory and valuation of the property complete enough to lay before a meeting to-day.—The prospects of the iron trade in this district are now most unsatisfactory. Lord Ward's agent has issued a circular, offering forged pigs at 3l. 10s., the nominal price fixed at the last quarter-day having been 5l.; it is proper to state, however, that few sales were effected at this last figure. On Saturday last, pursuant to agreement, notice was given to the furnace-men, mill-men, and puddlers, and all labourers engaged in the iron trade of this district, of a reduction of wages equal to 20 per cent. Notice has also been given to the coal and stone getters of a reduction, in the case of the former of 1s. per day, in the latter 9d. We have been informed that strong symptoms of dissatisfaction with this resolution have been displayed by the workmen, and it is expected that a strike will be the consequence. Throughout the district the makers are rapidly contracting their operations, and as the circular above quoted shows, the price of iron has fallen considerably. Gloomy though the state of things is, there can be no doubt that the turn of the year will revive our staple trade, and place it in a still more healthy position than that which it has recently enjoyed. By February, purchasers must come into the market, and the stocks being low, a general resumption of labour, at remunerative prices, will be the consequence.—*Birmingham Journal.*

DALRY.—The iron-works are again in full operation—the furnaces were in blast on Monday, having been only one week suspended. The workmen are in full employment. Business here is very brisk.

## NEW PATENTS.

W. Westbrooke Squires, Paris, M.D., for a mode or modes of producing a vacuum, which modes or modes may be applied to pneumatic, hydraulic, and hydrostatic apparatus, and to machinery for obtaining motive power.

R. Wrighton, Lower Brooke-street, Grosvenor-square, Middlesex, gent., for improvements in apparatus to be applied for railway carriages and engines.

C. A. F. Rochez, Paris, merchant, for certain improvements in treating zinc ores, and in manufacturing oxide of zinc.

H. S. Baker, Boston, U.S., America, for a certain new and useful improvements in steam-boiler furnaces.

R. Baird, Dundee, Scotland, engineer, for a new or an improved method of communication between the guards, engine-drivers, and other servants in charge of carriages and waggons on railways, and also between the passengers and engine-drivers and other servants in charge of such trains.

C. W. Siemens, Manchester, engineer, for improvements in engines to be worked by steam and other fluids.

R. Stamp, Chelsea, hatter, for improvements in the manufacture of fabrics to be used for covering hats, caps, and bonnets, which fabrics may be used for other articles of wearing apparel.—*Mechanics' Magazine.*

## CORNISH STEAM-ENGINES.

The number of pumping-engines reported for the month of Nov. is 28—the quantity of coals consumed being 1783 tons, lifting, in the aggregate, 17,000,000 tons of water 10 fathoms high—the average duty of the whole is, therefore, 53,000,000 lbs. lifted 1 foot high by the consumption of a bushel of coal.—The following have exceeded the average:—

| Mines. | Engines. | Length of stroke | Load in pounds. | Load per sq. inch. on pist. | Strokes per min. | Consump. of coal in bus. | Million lbs. lifted 1 foot by consump. of 1 bush. coal | Average quantity of water per min. |
|---|---|---|---|---|---|---|---|---|
| Wh. Prosper.. | Western, 80-in. | 9·7 | 94,275 | 15·0 | 3·6 | 3000 | 55·2 | 1002 |
| Ditto .... | Robert's 70-in. | 9·5 | 54,483 | 10·8 | 6·2 | 1680 | 61·0 | |
| Great Work.. | Leeds's 60-inch | 9·0 | 47,020 | 12·9 | 7·2 | 1818 | 55·2 | 171 |
| United Mines | Taylor's 85-in. | 11·0 | 97,108 | 15·5 | 4·7 | 2313 | 83·9 | |
| Ditto .... | Cardoza's 90-in. | 9·0 | 98,468 | 13·7 | 5·2 | 2980 | 58·1 | |
| Ditto .... | Eldon's 30-inch | 9·0 | 13,631 | 16·0 | 8·2 | 507 | 69·3 | 1113 |
| Ditto .... | Hocking's 85-in | 10·0 | 99,093 | 14·6 | 5·5 | 3256 | 59 9 | |
| East Wh. Rose | Penrose's 70 in. | 10·0 | 54,114 | 12·6 | 3·4 | 1218 | 58·3 | |
| Ditto .... | Michell's 70 in. | 10·0 | 61,775 | 14·4 | 3·2 | 1160 | 66·1 | 480 |
| Wh. Mary Con. | ,, 63-in. | 8·66 | 29,261 | 9·3 | 6·1 | 1100 | 58·6 | 258 |

## COAL MARKET, LONDON.

PRICE OF COALS PER TON AT THE CLOSE OF THE MARKET.

MONDAY.—Adair's Main 17—Davison's West Hartley 18 6—Dipton Tanfield 15 6—New Tanfield 16—Ord's Redheugh 17—Stewart's Hartley 17 to 18 6—West Wylam 17—Harraton Main 17 6—Wall's End Clennell 18 9—Elm Park 20—Hedley 20 6—Hilda 20 3—Bell 21—Haswell 21 9—Lambton 21 9—Stewart's 21 9—Whitwell 20 3—High Thornley 18 6—Seymour Tees 20 9—Ships at market, 17—sold, 14.

WEDNESDAY.—Adair's Main 17 9—Hasting's Hartley 20—Stewart's Hartley 18 6 to 19—West Wylam 17 6—West Hartley 20—Wall's End Acorn Close 21 6—Hebburn 21 6—Hilda 21 6—Belmont 22—Braddyll's Hetton 22 6—Haswell 22 6—Hetton 22 6—Grange Lyons 22—Lambton 22 6—Lumley 21 9—Russell's Hetton 22 6—Sepping 18—Stewart's 22 6—Whitwell 21 6—Richardson's Tees 21—South Durham 21 9—Tees 22 6—West Peace 18 6.—Ships at market, 45; sold, 42.

FRIDAY.—Hasting's Hartley 21—Holywell Main 21—Stewart's Hartley 18 6—Wall's End Hilda 22 6—Northumberland 22 6—Eden Main 23 6—Hetton 23 6—Russell's Hetton 23 6—South Durham 23—Tees 23 6—Whitworth 21—Derwentwater Hartley 20 9.—Ships at market, 11.

Geological Works.—On a recent application having been made to the Government authorities by Sir Roderick Murchison on the subject, a communication has been made with the Customs' authorities by one of the secretaries to the Lords Commissioners of the Treasury, stating that he has been commanded by their lordships to permit the admission, duty free, of a number of copies of a geological work on the distant regions of the Petchora; and to desire those authorities would give the necessary directions for the delivery of so many copies of the work in question, duty free, as were intended for presentation to scientific societies. In pursuance of this communication, the requisite directions have been given by the Customs' authorities, in order that their lordships' wishes may be duly complied with.

Great Western Finances.—The borrowed money equals 90 per cent. of the paid-up capital of this company; and, if they capitalised that debt, it would receive a much less dividend than 8 per cent. No other company has so large a proportion of loans. Nothing will satisfy a great number of the shareholders, but a thorough revision of its financial condition by an impartial committee of investigation. It ought not to be left to reluctant shareholders to propose so invidious a step.—*Railway Record.*

Electric Telegraph.—Mr. Samuel Porter, of Harrow, a schoolmaster of considerable mechanical ingenuity, petitioned the last Parliament on this subject. This petition is printed in the votes of 5th July last. He represents that, in 1825, he suggested to Government a method of instantaneous communication by means of electric wires in glass tubes (laid under the surface of the roads). He sets forth his communications with the Admiralty, the *Times*, and *Herald*, in 1837, and 1838, and the telegraph erected in 1837, by wires from the steeple of Notre Dame, at Munich. He also invented a magnetic sundial, a universal almanack, and a weather observator.—*Ibid.*

## PRICES OF MINING SHARES.

### BRITISH MINES.

| Shares. | Company. | Paid. | Price. |
|---|---|---|---|
| 1000 | Abergwessin | 7 | — |
| 512 | Albert Consols | 1 | 2½ |
| 1024 | Alfred Consols | 4½ | 30 |
| 256 | Alternum Consols | 2 | 15 |
| 235 | Andrew and Nangiles | 28½ | 11½ |
| 10000 | Ayrshire Iron Company | 3 | 1½ |
| 1624 | Balleswidden | 9 | 18 |
| 128 | Balnoon Consols | 25 | 25 |
| 10000 | Banwen Iron Co. | 2 | — |
| 1000 | Barristown | 4½ | 10 |
| 4000 | Bedford | 2½ | 3¼–¾ |
| 128 | Besore Lead Mine | 14 | 10 |
| 315 | Birch Tor Tin Mine | 24½ | — |
| 8000 | Blaenavon | 50 | 28 |
| 100 | Botallack | 175 | 80 |
| 120 | Brewer | 5 | 7 |
| 10000 | British Iron, New, regis. | 10 | 12½ |
| — | Ditto ditto, scrip | 10 | 12 |
| 128 | Budnick Consols | 52½ | 40 |
| 128 | Burthy | 20 | 21 |
| 100 | Bwlch Cwmerfin | 20 | — |
| 128 | Callestock | 17 | 30 |
| 1000 | Callington | 19 | 34 |
| 20000 | Cameron's Steam Coal | 4 | 3¾–¾ |
| 256 | Caradon Copper Mine | 9½ | 1 |
| 256 | Caradon Mines | 22½ | 17 |
| 256 | Caradon United | 24 | 5 |
| 256 | Caradon Wh. Hooper | 21 | 12 |
| 1000 | Carn Brea | 15 | 102½ |
| 2048 | Cascade | 1 | 2 |
| 112 | Charlestown | 220 | 30 |
| 166 | Cleveland | 9 | 5 |
| 512 | Coatlithe Hill | ½ | 2 |
| 1900 | Combmartin | 7½ | 3 |
| 500 | Comblawn | 5¼ | 6 |
| 128 | Comfort | 45 | 90 |
| 256 | Condurrow | 20 | 34–5 |
| 2560 | Cook's Kitchen | 14 | 2 |
| 2048 | Coombe Tin Mine | 4½ | 2 |
| 1000 | Coombe Valley Quarry | 2 | 3 |
| 1000 | Copper Bottom | 1 | 1 |
| 1024 | Cosheen | 4½ | 20 |
| 240 | Craddock Moor | 15½ | 15 |
| 128 | Creeg Braws | 120 | 100 |
| 500 | Cubert Mine | 12½ | 15 |
| 2048 | Dartmoor Consols | 2 | 2 |
| 300 | D. Prior & Buckfastleigh | 14 | 26 |
| 7500 | Demelza Mines | 2 | 2 |
| 7100 | Derwent | 8½ | 5 |
| 1024 | Devon & Courtenay Con. | 7½ | 2 |
| 1024 | Devon Great Consols | 1 | 210–20 |
| 1000 | Dhurode | 2 | 5 |
| 186 | Dolcoath | 30 | 50 |
| 2560 | Drake Walls | 4 | 4 |
| 10000 | Durham County Coal | 45 | 9 |
| 3000 | Dyfngwm | 10 | 12½ |
| 256 | East Alvenney | 10 | 25 |
| 112 | East Caradon | 42 | 42 |
| 2048 | East Crowndale | 4½ | 3½ |
| 512 | East Combe Silver-Lead | 6½ | 6½ |
| 128 | East Pool | 5 | 20 |
| 100 | East Relistian | 22 | 40 |
| — | East Wheal Albert | 1 | 3 |
| 94 | East Wheal Crofty | 280 | 125 |
| 256 | East Wheal Fortune | 2 | 3 |
| 128 | East Wheal Rose | 50 | 1200 |
| 2048 | East Wh. Rough Tor | ½ | 2 |
| — | East of Scotland Iron Co. | 2½ | ¼ |
| 123 | East Wheal Seton | 14 | 15 |
| 256 | Elborough | 1½ | 2 |
| 256 | Exmoor Wh. Eliza | 3½ | 6 |
| 512 | Fowey Consols | 40 | 45 |
| 6400 | Gadair | 2 | 2 |
| 20000 | Galvanised Iron Co. | 10 | 9½ |
| 10000 | Gen. Mining Co. for Irel. | 2 | 1¼ |
| 2048 | Georgia Tin Mines | 1½ | 1½ |
| 256 | Gonamena | 31½ | 45 |
| 128 | Goonvrea | 4 | 1¼ |
| 244½ | Grambler & St. Aubyn | — | 10 |
| 100 | Great Consols | 1000 | 400 |
| 256 | Great Callestick Moors | 22 | 25 |
| 2560 | Great Michell Consols | 1½ | 3½ |
| 256 | Great Resugga Moor | 7 | 10 |
| 512 | Gt. Wh. Rough Tor Con. | 13½ | 25 |
| 100 | Gregwinion | 5 | — |
| 256 | Gwinear Consols | 7 | 20 |
| 1000 | Harrowbarrow Old Mine | 8½ | 2 |
| 6000 | Heignston Down Con. | ½ | 2½ |
| 256 | Herodscombe | 4½ | 4½ |
| 256 | Herodsfoot | 16 | 18½ |
| 10000 | Hibernian | 12½ | 1½ |
| 239 | Hobb's Hill | 6 | 3 |
| 1000 | Holmbush | 19 | 11 |
| 827 | Kirkcudbrightshire | 5¾ | 6 |
| 2048 | Lamberooe Wh. Maria | 11 | 4 |
| 128 | Lelant Consols | 90 | 60 |
| 160 | Levant | — | 90 |
| 1000 | Lewis | 15 | 6½ |
| 1000 | Llwyn Malees | 5 | — |
| 3600 | Llynvi Iron | 50 | 50 |
| 256 | Lostwithiel Consols | 15 | 15 |
| 6000 | Marke Valley | 10 | 3 |
| 5000 | Mendip Hills | 2½ | 1¼ |
| 5000 | Merionethshire Slate & Slate Slab Co. | 1½ | 2 |
| 20000 | Mining Co. of Ireland | 7 | 6½ |
| 256 | New East Crowndale | 3½ | 3½ |
| 128 | North Fowey Consols | 30 | 30 |
| 100 | North Pool | 45 | 370 |
| 70 | North Roskear | 10½ | 310 |
| 256 | North Wh. Abraham | 1 | 1 |
| 262 | North Wh. Leisure | 1½ | 2 |
| 128 | North Wh. Providence | 2½ | 3 |
| 15000 | Northern Coal Co. | 23 | 2 |
| 128 | Par Consols | 900 | 1000 |
| 4000 | Pennant | 1½ | 2½ |
| 100 | Penrhiw | 30 | 65 |
| 1280 | Perran St. George Un. | 13 | 20 |
| 128 | Perran Wh. Virgin | 9½ | 15 |
| 512 | Plymouth Wh. Yeoland | 4½ | 25 |
| 256 | Polsaith Consols | 4½ | 7 |
| 112 | Providence Mines | 35 | 45 |
| 10000 | Rhymney Iron | 50 | 20 |
| 10000 | Ditto New | 7 | 6½ |
| 256 | Rose Consols | 10 | 2 |
| 1000 | Rosewall Hill | 1 | 5 |
| 256 | Rosewarva Mines | — | 12 |
| — | Shotts Iron Company | 50 | 55 |
| 2500 | Silver Valley | 5 | 2 |
| 1100 | South Dolcoath | 3 | 2½ |
| 128 | South Caradon | 10 | 450 |

### BRITISH MINES—*continued.*

| Shares. | Company. | Paid. | Price. |
|---|---|---|---|
| 256 | Sth. Friendsh. Wh. Ann | 16 | 25 |
| 200 | South Harvannah | 10 | 25 |
| 256 | South Tolgus | 7½ | 40 |
| 256 | South Trelawney | 20 | 8½ |
| 128 | South Yeoland | 16½ | 20 |
| 128 | South Wheal Basset | 110 | 90 |
| 256 | South Wh. Betsey | 2½ | 5 |
| 124 | South Wh. Francis | 160 | 200 |
| 256 | South Wh. Hope | — | 5 |
| 1000 | South Wh. Maria | 2½ | 2 |
| 256 | South Wheal Rose | 11½ | 1 |
| 256 | South Wh. Sophia | 4 | 4½ |
| 10000 | Southern & Western, Irish | 2 | 4 |
| 280 | Spearne Moor | 30 | 40 |
| 256 | St. Austell Consols | 9 | 10 |
| 94 | St. Ives Consols | — | 320 |
| 128 | St. Michael Penkivel | 5 | 10½ |
| 1000 | Stray Park | 43 | 20–2 |
| 9600 | Tamar Consols | 3 | 4 |
| 1024 | Tavy Consols | 4 | 5½ |
| 6000 | Tincroft | 7 | 8 |
| 1000 | Tin Vale | 2 | 2 |
| 128 | Tokenbury | 143½ | 10 |
| 256 | Trehane | 2 | 27 |
| 5000 | Treleigh Consols | 6 | 3½ |
| 2000 | Trenance | 2 | 50 |
| 96 | Tresavean | 10 | 250 |
| 120 | Trethellan | 5 | 16 |
| 120 | Treviskey and Barrier | 130 | 130 |
| 268 | Trevean | 1½ | 25 |
| 128 | Trewellard | 12 | 26½ |
| 100 | United Mines | 300 | 350 |
| 256 | Wellington Mines | 15 | 30 |
| 128 | West Basset | 45 | 30 |
| 256 | West Caradon | 20 | 140 |
| 128 | West Cargoll | 2 | 12 |
| 512 | West Fowey Consols | 40 | 15 |
| 256 | West Providence | 9 | 25 |
| 200 | West Seton | 40 | 150 |
| — | West of Scotland Iron Co. | 210 | 210 |
| 120 | West Trethellan | 5 | 35 |
| 256 | West United Hills | 6½ | 1 |
| 256 | West Wh. Friendship | 9 | 12 |
| 3845 | West Wheal Jewel | 11 | 1½ |
| 2560 | West Wh. Maria | 2½ | 1½ |
| 2560 | West Wheal Rough Tor | ½ | 2 |
| 256 | West Wheal Shepherd | 5 | 2½ |
| 256 | West Wheal Tolgus | 21½ | 5 |
| 256 | West Wheal Treasury | 19 | 10 |
| 5200 | Wicklow Copper | 5 | 11 |
| 184 | Wheal Adams | 51 | 10 |
| 1000 | Wheal Agar | — | 10 |
| 256 | Wheal Albert | 10 | 8 |
| 128 | Wheal Acland | 13 | 2 |
| 256 | Wheal Allen | 2 | 5 |
| 237 | Wheal Anderton | 18 | 25 |
| 128 | Wheal Ann | — | 50½ |
| 512 | Wheal Ann, Bridford | 1 | 2 |
| 512 | Wheal Anna Maria | — | 5 |
| 1024 | Wheal Ash | 4½ | 8 |
| 120 | Wheal Bal | 5½ | 20 |
| 2560 | Wheal Barbara | 1½ | 4–5 |
| 256 | Wheal Benny | 10½ | 6 |
| 256 | Wheal Blencowe | 8 | 8 |
| 256 | Wheal Bucketts | 20 | 5 |
| 256 | Wheal Calstock | 3 | 4 |
| 136 | Wheal Clifford | 190 | 190 |
| 1024 | Wheal Coad | ½ | 1 |
| 128 | Wheal Courtenay | — | 20 |
| 6000 | Wheal Curtis | 2½ | 3–3½ |
| 256 | Wheal Dyke | 12 | 13 |
| 256 | Wheal Fortescue | 6½ | 5 |
| 512 | Wheal Fortune Consols | 3½ | 6½ |
| 2048 | Wheal Frederick | 2 | 2 |
| 388 | Wheal Franco | 27 | 30 |
| 128 | Wheal Harriet | 45 | 50 |
| 256 | Wheal Jane | 21 | 15 |
| 256 | Wheal Louisa | 8½ | 8 |
| 112 | Wheal Margaret | 79 | 250 |
| 512 | Wheal Mary Ann | 5 | 18 |
| 256 | Wheal Mary Consols | 38 | 25 |
| 210 | Wheal Prospect | 4 | 7 |
| 120 | Wheal Reeth | 27 | 80 |
| 128 | Wheal Rose | 60 | 45 |
| 2048 | Wheal Samson | ½ | 20 |
| 99 | Wheal Seton | 214 | 1100 |
| 256 | Wheal Sisters | 29½ | 20 |
| 256 | Wheal Sophia | 5 | 10 |
| 128 | Wheal Spearne | 10 | 75 |
| 128 | Wheal St. Ann | 9 | 15 |
| 260 | Wheal Trelawney | 7½ | 95 |
| 256 | Wh. Tremaine (St. Ervan) | 4½ | 20 |
| 256 | Wheal Tremayne | 35 | 25 |
| 128 | Wheal Trew | 20 | 21 |
| 256 | Wheal Trevenna | 3 | 4 |
| 92 | Wheal Tryphena | 140 | 265 |
| 128 | Wheal Venland | 13½ | 4 |
| 256 | Wheal Vlow (Perranz.) | ⅜ | ⅝ |
| 184 | Wheal Vyvyan | — | 60 |
| 256 | Wheal Williams | 6 | 12 |

### FOREIGN MINES.

| Shares. | Company. | Paid. | Price. |
|---|---|---|---|
| 5000 | Alten Mining Company | 14½ | 3½ |
| 15000 | Asturian Mining Co. | 11 | 5½ |
| 20000 | Australian | 2½ | 3¾ |
| 10000 | Anglo-Mexican Co. | 100 | 2 |
| 12374 | Ditto Subscription | 25 | 2½ |
| 3000 | Bolanos | 150 | 3½ |
| 2000 | Ditto Scrip | 15 | 3½ |
| 12000 | Brazilian Imperial | 23 | 5 |
| 10000 | Cobre Copper Co. | 40 | 18 |
| 8500 | Colombian Co. regis. | 55 | 1 |
| 5000 | Ditto Scrip | 5½ | |
| 5000 | Copiapo Mining Co. | 14 | 2½ |
| 10000 | General Mining Ass'n. | 20 | 13–14 |
| 5000 | Kinzigthal Mining Ass. | 2 | 2¾ |
| 20051 | Mexican Company | 59 | — |
| 2000 | Mexican & South Amer. | 7 | 1¾ |
| 5000 | Mocaubas & Cocaes | 30 | 6 |
| 29320 | Rl. del Monte, regis. / Ditto unregistered | 28½ | 1½ |
| | Ditto Red Debentures | — | 10 |
| | Ditto Black ditto | — | 8 |
| | Ditto Loan Notes | 150 | 60 |
| 7000 | Royal Santiago | 10 | 6 |
| 2000 | Pachuca Mines | 4 | 4½ |
| 11000 | St. John del Rey | 15 | 6½ |
| 43174 | United Mexican ...Av. | 28½ | 1¾–2 |

### SOUTH AUSTRALIAN SHARE MARKET.

| Shares. | Company. | Paid. | Price. | Shares. | Company. | Paid. | Price |
|---|---|---|---|---|---|---|---|
| 2000 | Adelaide | 5 | 7½ | 1000 | Poonawurta | — | 9½–10 |
| 6000 | Barossa Range | ⅞ | 2½ | 400 | Princess Royal | 34 | 259 |
| 2464 | Burra Burra | 5 | 110 | 10000 | Royal Mining Company | ½ | 1½ |
| 436 | Grand Junction | 15 | 28 | 10000 | Royal South Australian | — | 55½ |
| 100000 | Scottish Invest. Co. | 1 | 1¼ | 600 | Victoria | 2 | 3 |
| 18 | South Para | 15 | 50 | 500 | Wakefield | 2 | 3 |

*** We should feel greatly obliged by agents, or others interested, furnishing us with such corrections for our Share List as we may not have received through our usual channels of information—our object being, to present as accurate a list of prices as can be obtained—to procure which, we solicit the aid of correspondents in general.*

## MISCELLANEOUS COMPANIES.

| Shares. | Companies. | Paid. | Div. p. cent. | Price. |
|---|---|---|---|---|
| 10,000 | Assam Tea Company | £20 | — | £ 3 |
| 1,080 | Auction Mart | — | £ ⅞ | 28 |
| 10,000 | Australian Agricultural | 30 | 1 | 20 22 |
| 10,000 | Australian Trust | 35 | — | 30 |
| 8,000 | British Alkali | 25 | 4 | 16¾ |
| 10,000 | British American Land | 35½ | — | 14 |
| 8,600 | British Rock and Patent Salt | 35 | 18 | 11 |
| 9,915 | Canada | 32½ | 6 | 30 30½ |
| — | City Bonds (Navigation) | — | 3½ | 89 |
| 1,800 | Corn Exchange | 37½ | 1½ | 26½ |
| 5,000 | Droitwich Patent Salt | 25 | ¾* | 11 |
| 2,700 | Equitable Reversionary | 95 | 4½ | 87 90 |
| — | General Reversionary Interest | 100 | 5 | 100 105 |
| 0,000 | General Steam Navigation | 14 | 1⅞* | 23½ |
| — | Hudson's Bay Stock | — | 10 | 230 240 |
| 2,100 | Hungerford Market | 100 | ⅞ | — |
| 1,500 | London Commercial Sale Rooms | — | 1⅞ | 31 32 |
| 8,000 | London Reversionary | 22 | — | 23 24 |
| 300 | Margate Pier | — | 10 | 196 |
| 10,000 | Mexican and South American | 7 | — | 3½ 4 |
| 20,000 | New Brunswick | 75 | — | — |
| 11,600 | Peninsular and Oriental Steam | 50 | 7 | 56 58 |
| 6,600 | Ditto | 40 | — | — |
| 5,387 | Reversionary Interest Society | 100 | 4½* | 97 98 |
| — | Royal Mail Steam | — | 5½ | 52 53 |
| 8,000 | South Australian | 25 | 6 | — |
| 20,000 | Upper Canada | 100 | 5 | 93 94 |
| 20,000 | Ditto | — | 5 | 93 94 |
| 10,000 | Van Diemen's Land | 20 | — | 4 |

North and South Wales Bank.—We are glad to learn the directors will resume payment of its notes on Monday, the 3d of Jan. next, at its head office in Liverpool, and at all its branches, and in London. The liabilities of the bank have been reduced to 208,000l. since the date of its stoppage, and it is confidently expected, that it will soon recommence business in full.

Marble Quarry, near Leghorn.—A marble quarry has recently been opened in Maremma, about 35 miles from Leghorn. The quarry appears to have been worked in ancient times, possibly by the Etrurians; and some chisels and picks have been found there, which closely resemble those now in use. Mr. Powers, the American sculptor, thus speaks of it in a private letter:—"I intend to make the statue of Mr. Calhoun out of this marble, and it will, perhaps, be the first full-sized statue made of it in 2000 years. I am now making a bust of Washington from this marble somewhat larger than life, by way of an experiment. It is nearly blocked out, and I am satisfied already, that the effect will be all that could be wished. It is singular that the owner of the quarry is a Greek, who has found the marble, supposed to be peculiar to his own country, here in Tuscany. He can afford this marble for less than one-half the price of Carrara, on account of the great ease and small expense of excavating and taking it to the sea-shore. The marble has a rich warm colour, so desirable in statues and busts, and it is most beautiful in columns, mantle-pieces, and the like. The grain is coarse, like the Parian, but it works smoothly and takes a high polish."—The *Builder*.

## Stannaries of Cornwall—In the Vice-Warden's Court.

PURSUANT to a DECREE of the VICE-WARDEN'S COURT, made in the cause of HODGE v. KIRKMAN, the CREDITORS, in respect of ALVIGGAN MINE, in the several parishes of St. Stephens, in Branwell, and St. Hewan, within the said Stannaries, are, on or before the 5th day of January next, to come in and PROVE their DEBTS before the Registrar of the said Court, at his office, in Truro, or, in default thereof, they will be excluded the said Decree.

Dated Registrar's Office, Truro, Dec. 23, 1847.

## JOINT-STOCK BANKS.

| Shares. | Companies. | Paid. | Div. p. cent. | Price. |
|---|---|---|---|---|
| 22,500 | Australasia | £40 | £3 | £15 |
| 20,000 | British North American | 50 | 5 | 44½ |
| 20,000 | Colonial | 25 | 5 | 14½ |
| — | Commercial of London | 20 | 6 | 22 23 |
| 4,000 | Ionian State | 25 | 6 | 24½ 25 |
| 60,000 | London Joint-Stock | 10 | 6 | 15 |
| 30,000 | London and Westminster | 20 | 6 | 23½ |
| 10,000 | National Provincial of England | 35 | 5 | 35 |
| 20,000 | National of Ireland | 22½ | 5 | 19½ 19¾ |
| 20,000 | Provincial of Ireland | 25 | 8 | 40 42 |
| 4,000 | Ditto New | 10 | 8 | 19½ |
| 20,000 | Union of Australia | 25 | 6 | 24 25 |
| 10,000 | Ditto New | 2½ | 6 | 2½ 2¾ |
| 60,000 | Union of London | 16 | 5 | 10¾ |

## GAS-LIGHT AND COKE COMPANIES.

| Shares. | Companies. | Paid. | Div. p. cent. | Price. |
|---|---|---|---|---|
| 5,000 | British (London) | £18 | £1* | £17½ |
| 5,000 | Ditto (country) | 19 | 1⅞* | 22½ |
| 1,000 | City of London | 100 | 10 | 290 |
| 1,000 | Ditto New | 100 | 10 | 290 |
| 4,000 | Equitable | 50 | 2½ | 36 |
| 10,000 | European | 20 | 1½ | 18 |
| 12,000 | Gas-Light and Coke Chartered Co. | 50 | 6 | 57½ |
| 6,000 | Ditto New | 10 | 6* | 11 11½ |
| 9,000 | General United Gas-Light Company | 50 | 2 | 17½ 18½ |
| 10,000 | Imperial | 50 | 6 | 78½ |
| 46,400l. | Ditto Debentures | 100 | 4 | 100 |
| 8,000 | Imperial Continental | 39½ | 4½* | 54 56 |
| 7,000 | Ditto New | 28 | 4½* | 61 |
| 54,500l. | Ditto Debentures | 100 | 5 | 100 102 |
| 2,000 | Independent | 40 | 6 | 64 |
| 3,000 | London | 50 | 6 | 49 50 |
| 3,000 | Ditto | 50 | 5 | 48 |
| 9,000 | Phœnix, or South London | 43 | 5 | 35 |
| 1,000 | Ratcliff | 80 | 5 | 80 |
| 4,000 | South Metropolitan | 25 | 6 | 31 32 |

* Those marked with an asterisk (*) are dividend per share.

## LEAD ORES.

*Sold at Aberystwith.*

| Mines. | Tons. | Amount. | Purchasers. |
|---|---|---|---|
| Frongoch | 65 | £9 10 6 | Sims & Co. |
| Darran | 42 | 16 1 0 | B. Somers. |
| *Sold in London.* | | | |
| Cubert | 20 | £9 11 0 | Walker, Parker, & Co. |

## BLACK TIN.

| Mines. | Tons. | Price per ton. | Purchasers. |
|---|---|---|---|
| Wheal Anderton | 2½ | £38 10 0 | Calenick Smelting Co. |
| ditto | 2¾ | 37 12 6 | Williams and Co. |
| ditto | 1 | 26 10 0 | Calenick Smelting Co. |

## COPPER ORES.

*Sampled Dec. 1, and Sold at Andrew's Hotel, Redruth, Dec. 23, 1847.*

| Mines. | Tons. | Price. | Mines. | Tons. | Price. |
|---|---|---|---|---|---|
| Devon Gt. Cons. / Wh. Josiah | 122 | £5 16 6 | Tresavean | 91 | £9 13 6 |
| ditto | 110 | 6 9 6 | ditto | 83 | 5 1 6 |
| ditto | 95 | 9 7 0 | ditto | 59 | 2 9 6 |
| ditto | 89 | 8 10 6 | West Caradon | 92 | 6 0 0 |
| ditto | 78 | 6 6 0 | ditto | 57 | 6 2 6 |
| ditto | 76 | 7 3 6 | ditto | 56 | 6 17 6 |
| ditto | 65 | 7 0 6 | ditto | 48 | 4 0 6 |
| ditto | 40 | 6 8 6 | ditto | 46 | 10 8 6 |
| ditto | 39 | 6 6 6 | Marke Valley | 110 | 2 18 6 |
| ditto | 25 | 6 11 6 | ditto | 100 | 3 3 6 |
| Wh. Maria | 126 | 6 7 0 | ditto | 56 | 2 10 0 |
| ditto | 121 | 5 15 0 | ditto | 27 | 3 0 0 |
| ditto | 116 | 6 8 0 | Fowey Consols | 99 | 5 15 6 |
| ditto | 70 | 8 3 0 | ditto | 90 | 6 8 0 |
| ditto | 14 | 2 6 6 | ditto | 87 | 6 8 0 |
| Wh. Fanny | 104 | 8 9 0 | Wh. Friendship | 103 | 9 2 6 |
| ditto | 64 | 6 2 0 | ditto | 100 | 6 17 6 |
| ditto | 24 | 6 18 0 | ditto | 47 | 4 12 0 |
| ditto | 18 | 4 9 0 | Bedford United | 123 | 9 14 0 |
| Wh. Anna Maria | 47 | 4 14 6 | West Wh. Jewel | 65 | 3 5 6 |
| ditto | 42 | 3 14 0 | ditto | 44 | 3 10 6 |
| ditto | 15 | 4 3 6 | Holmbush | 86 | 5 2 0 |
| Tresavean | 98 | 3 0 6 | Wh. Gorland | 24 | 4 15 0 |
| | | | Ting Tang | 5 | 1 15 6 |

TOTAL PRODUCE.

| | | | | | |
|---|---|---|---|---|---|
| Devon Gt. Cons. / Wh. Josiah / Wh Fanny / Wh. Maria / Wh. Anna Maria | 1500 | £9715 11 0 | Fowey Consols | 276 | £1704 10 6 |
| | | | Wh. Friendship | 250 | 1843 11 6 |
| | | | Bedford United | 123 | 1193 2 0 |
| | | | West Wh. Jewel | 109 | 367 19 6 |
| | | | Holmbush | 86 | 438 12 0 |
| Tresavean | 331 | 1744 2 6 | Wh. Gorland | 24 | 114 0 0 |
| West Caradon | 299 | 1957 9 6 | Ting Tang | 5 | 8 17 6 |
| Marke Valley | 293 | 860 5 0 | | | |
| Average Standard | | £ 90 5 0 | Average Produce | | 9¾ |

Average Price per ton ........ £6 1 0

Quantity of Ore ........ 3296 tons. | Quantity of Fine Copper, 321 tons 9 cwts.

Amount of Money ........ £19,948 1 0

LAST SALE.—Average Standard......£ 22 9 0.—Average Produce...... 9¾

### COMPANIES BY WHOM THE ORES WERE PURCHASED.

| | Tons. | Amount. |
|---|---|---|
| Mines Royal | 65 | £302 3 6 |
| English Copper Company | 406 | 1470 12 6 |
| Vivian and Sons | 955 | 5344 8 0 |
| Freeman and Co. | 246 | 1499 1 6 |
| P. Grenfell and Sons | 261 | 1631 15 6 |
| Crown Copper Company | 41 | 397 14 0 |
| Sims, Willyams, and Co. | 237 | 1958 13 0 |
| Williams, Foster, and Co | 1085 | 7343 13 0 |
| Total tons | 3296 | £19,948 1 0 |

Copper ores for sale on Thursday next, at Andrew's Hotel, Redruth.—Mines and Parcels.—United Mines 1449—Par Consols 414—South Caradon 377—Creegbraws 217—Treleigh Consols 155—Wheal Comfort 88—West Trethellan 54—Wheal Mary Consols 50—South Tolgus 50—Wheal Brewer 47—United Hills 20—East Downs 19—North Downs 15—Wheal Ruby 13—Wheal Unity Wood 9.—Total, 2977 tons.

Copper ores for sale on Thursday week, at Andrew's Hotel, Redruth.—Mines and Parcels.—North Roskear 804—Consolidated Mines 676—Tincroft 426—South Wheal Francis 345—Fowey Consols 319—Wheal Seton 314—Wheal Chance 171—Wheal Bucketts 105—Wheal Harriet 79—South Wheal Basset 54—Great Michell Consols 52—Lanivet Consols 41—Wheal Henry 31—Cook's Kitchen 27.—Total, 3444 tons.

*Remarkable Mining Fatality.*—On Monday last, at West Bromwich, Mr. Dabbs was ascending the shaft of an exhausted coal mine; he had taken, according to the practice of the district, the working of the iron and limestone, and had been down to see his men begin the labour of the day. The skid (a platform suspended from four chains) on which he was ascending had nearly reached the surface, when some one unloosed an unruly pony from a waggon, and the animal, in spite of every effort to restrain it, forced itself to the edge of the shaft, and fell over upon Mr. Dabbs. He was thrown to the bottom of the mine, and killed on the spot, leaving a widow with six young children, and far advanced in pregnancy.

*Great Lumley.*—As S. Lewins was descending the shaft of the Arbour Housepit, a cage was being drawn to the bank, by which he was crushed, and killed.

NOTICES TO CORRESPONDENTS.

It will at all times save much trouble, and frequently considerable delay, if communications are simply directed—

To the Editor,
*Mining Journal Office,*
26, Fleet-street, London.

Also, to avoid trouble, Post-Office Orders should always be made payable to William Salmon Mansell, as acting for the proprietors.

*** We should feel obliged to all pursers, captains, or adventurers, to forward particulars of meetings, &c., of the mines with which they may be connected, on the earliest opportunity, that they may be published in the Journal with as little delay as possible.

**The Title Page and Index,**

For the past year's Volume, will be given with next Saturday's Journal.

"W." (Leeds).—You had better give the order to your bookseller, who will supply it regularly.

Inverness.—We have received a second communication from Mr. G. Shepherd, C.E., in which he proposes to increase the diameter of his cylinder, in proportion to the depth of the sands.

We must impress upon our correspondents, the necessity of invariably furnishing us with their names and addresses; not that their communications should, consequently, be noticed, but as an earnest to us of their good faith.

The Mining Journal is published at about Eleven o'clock on Saturday morning, at the office, 26, Fleet-street, and can be obtained, before Twelve, of all news agents, at the Royal Exchange, and other parts of London.

**Glossary of Mining Terms.**

In the month of January next, we intend publishing, as a Supplement, an Entire Glossary of English and Foreign Mining Terms.—Subscribers and others wishing for copies of the Number, had better forward their orders, through their agents, to prevent disappointment: the charge for the Journal and Supplement will be Sixpence.

# THE MINING JOURNAL

**Railway and Commercial Gazette.**

LONDON, DECEMBER 25, 1847.

We are at length arrived at the last days of the calender. A few falling sands more, and the year 1847 will, with all its sufferings and its enjoyments, have rolled over into the unfathomable gulf behind us. It were for a thousand reasons to be desired that the long enumeration of errors and infirmities which are chargeable upon us, as a civilised and Christian community, could be rolled over into the same abyss, and, with their consequences and their memory, be for ever obliterated from the annals of the age. He would be a bold man who should attempt to write the history of the period. An unparalleled famine, a cloud of commercial failures, and a double pestilence, are some of the chief figures which sweep along the dramatic scene of his narrative. Our hope and trust is, that as we have nearly done with the year, so have we also nearly done with these adversities; but, if not, that we may truly learn the invaluable lessons which are frequently taught in that school: the peasantry of Ireland, for instance, that nothing can compensate for a want of persevering personal industry—that unless they will bring amongst them once more in its fullness the desolation from which they are not yet perfectly released, they must look incomparably less to politics or legislation than to the sweat of their brow for the improvement and amelioration of their circumstances. The merchants of England also will, we have no doubt, learn the danger of pressing trade beyond its just limits, and of multiplying the risks which are necessarily incidental to foreign commerce.

As to the class of alarmists, and that portion of the daily press which has wilfully and wantonly written up a panic, all hope of the conversion of this description of offenders is exceedingly faint, seeing they have so well succeeded in their efforts, and their appetite is rewhetted for that species of banquet; but it is to be expected that the reflecting portions of society will not again be made drunk by such stimulants, seeing to what an extent it has enlarged their losses and deepened their misfortune. Indeed, in a short time, we may be rather gainers, than otherwise, by the things we have endured. There never was a picture painted yet that had no lights and relief falling somewhere upon its dark masses; and, to us, the embarrassments we have encountered will not have been wholly unbeneficial, if, as we emerge out of them, we can certify each other that sweet are the uses of adversity. Looking, as well as we are able, to our commercial interests, in all their extent and variety, we see no reason to doubt that we shall enter upon the business of the new year in sounder circumstances, and governed by sounder principles of trade, than have attended us throughout a large portion of the year now expiring. This, we think, is perfectly true, as a general statement, and is true, more particularly, in reference to our mining undertakings—which, we are free to say, from the more business-like management of the mines themselves, and from the more defined responsibility of the shareholders, have never been in a state more satisfactory to those having an interest in their success.

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It at all times gives us great pleasure to be able to record that success has followed mining enterprise, attended, as it invariably is, with some risk on the chances of having hit upon a good sett; still in the generality of cases the principles of success may be traced to the exertions, attention, and a well-directed spirit of economy evinced by the directors. We have, in our columns of to-day, a report of the usual quarterly meeting of the shareholders in the Callington Mines, from which it will be seen that they are in a highly prosperous state; that the Kelly Bray Mine—a sett added subsequently to the establishment of the Callington Company—had turned out most prosperous, having already 6000*l.* worth of ore in sight, with every prospect of the lode holding good in length and depth. The reports of the directors and agent (Capt. Phillips), and the state of the accounts, gave great satisfaction to those present, and the meeting broke up, in the full expectation of a 20s. dividend at the next quarterly meeting, which will make the seventh paid the adventurers.

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The judgment given recently in the Vice-Chancellor's Court, in the cause "Curling *v.* Flight," is one with which we must take the liberty of saying, we are not satisfied. It was a suit to compel the performance of a contract, as to the purchase of some shares in mines, situated in the principality of Wales and in the county of Cornwall; and the dispute arises on a question of title—the vender relying on the registration of his name with the names of the other adventurers, and also on the uniform reception in all the Stannary Courts, and in the Superior Courts of Westminster, of such registration as sufficient proof of title. The defendant, on the other hand, alleges that such registration in the cost-books is only good as showing the relative rights of the adventurers as between themselves, and is no evidence to the purchaser of the right of an individual shareholder to sell, as he may have forfeited his right to the registered shares, or the whole mine may be working on trespass, and not on covenant. In this view of the defective nature of the title the Vice-Chancellor Wigram concurred, and gives judgment for the defendant. We deprecate this decision, because it introduces a new, and an unnecessary, element into the law of the case, and disturbs the ancient and prescriptive equity between the parties. Upon such evidence of title, as the cost-book supplies, the whole mining property of England has been changing hands for generations. If upon the sale of a single share (for if the new decision is law as to 100 shares, it is law as to one), the transfer must be encumbered with a retrospective examination of title as to shares, and of tenure as to the mine, much will be done to take away the marketable character of mining property. In this instance, the Court of Chancery stept out of its way, as we think, to assist the defendant in evading the responsibilities of his bargain; there is no pretence that the vender did not exhibit the *customary* title; but the vendee, under a new inspiration, or not relishing the terms of his contract, asks for a title which the seller cannot give, nor could be justly called upon to give; for the purchaser could have no claim to a title which was unknown to the subject matter of the sale. He tears the contract in pieces, because he cannot get with the shares a title which is alien to them, and the Court of Chancery sanctions this duplicity!

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We have given, in another column, a report by R. Phillips, Esq., F.R.S., F.G.S., the respected curator of the Museum of Economic Geology, Craig's-court, on the experiments now making at Swansea, on Mr. Bankart's new process for the reduction of copper ores. This document is of immense importance to the copper mining interest, and great credit is due to the executive of the Cobre Copper Company for the enterprise and liberality they have evinced, in being the first to offer aid to the patentee, to enable him to prove, by a large scale of working, whether the previous experiments on which his patent was founded, were based on sound scientific principles, and whether they could be carried out in practice with facility and economy. This, the report of Mr. Phillips (and a more impartial agent could not have been selected), and all the experiments which have hitherto been made, most fully confirms; and it now remains to be seen whether the wealthy capitalists and large body of less opulent mine adventurers, who have long complained of the arbitrary nature of the present system of disposing of their ores, the variableness of the standard, without any assigned or apparent cause or reason, and the complete control which the smelters have over the copper market of the world, will emancipate themselves from their thraldom, and throw open a trade which would be of such incalculable benefit to themselves, and of such great advantage to society at large.

In a letter, which we published in the Mining Journal of the 25th of Sept. last, Mr. Bankart expresses his fears, that "the hope of Cornwall emancipating itself from her present trammels of dependence, would not be realised," and assigns, as his reason for this opinion—first, from the practice of dividing the entire profits every two months, without any reserve of capital to enable them to erect the necessary works; and, second, from the apprehension, that the combination of the smelters, would prevent them disposing of either ore or copper, as a punishment for their temerity, in setting so powerful a body at defiance. It is really incredible, that a great commercial body should coincide in the utterance of such sentiments, more especially when the establishment of Mr. Bankart's process would not cost more than a mere fraction of *one* of the capitals sunk in the buildings and machinery of one of the present smelters. The advantages to be obtained are enormous—the refuse matter alone, at the lowest estimate, will more than pay all the expenses of reduction; 17½ cwts. of iron being employed for the precipitation of copper from its solution, gives, as will be seen by the report, five times its weight of sulphate of iron, or green vitriol—an article likely to come into most extensive use as a disinfectient. The oxide of iron remaining in the refuse, amounting to 46 per cent. downwards, can be smelted with facility; and, by this process, the copper in the ore, given by analysis, is, on reduction on a large scale, only minus 0·62 per cent. Here, then, the mine adventurer would not only reduce his ores into metallic copper, at a cost for coal and labour, averaging, according to circumstances, from 1*l.* 15s. 2d. to 16s.; but even this cost is covered by the merchantable materials produced. The Cobre Company have nobly pioneered the way, and we hope and think, that on the attainment of complete success, the whole body of adventurers in the mines of Cornwall and Devon will, for their own sakes, follow the example.

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Most of our readers are aware that, about three years since, an expedition, under the command of Capt. Sir John Franklin, left England on a voyage of discovery within the Arctic circle; its business in those high latitudes was to settle, if possible, some geographical doubts which existed, to prosecute some scientific investigations, and to find an outlet, through the frozen seas of that region, into the North Pacific Ocean—in fact, to run into the sea which washes the back of the great American Continent, through the long-searched-for North-western passage. The ships were well found in every requisite and convenient provision for accomplishing the objects designed—manned with picked men, and led by officers of the first rank in their profession, for skill, temper, and experience—the whole under the direction of a commander of consummate abilities, and especially of that class of qualifications, which were called for by the exigencies of such a service.

The time has now expired, at which the expedition should have returned successful or unsuccessful; and the anxieties of the Government are naturally awakened as to the present circumstances of the adventurers. Three expeditions are, therefore, planned—two to proceed in the spring to the north-eastern shore of the American continent, and one to take the route through Canada, in the hope that, in some of the parallels from 70° to 80° north, they may hear of the gallant navigators; and her Majesty's vessel, *Plover*, is getting ready by the first day of the new year to proceed to Behring's Straits, in the hope of finding the expedition struggling to that point in its passage to the Pacific. This voyage round the Horn, and up to 72° north, and about 150° west longitude, is one of extraordinary length—it is nearly equal to the circumnavigation of the globe; and, barring the accidents inseparable from such a variety of climates, and such a length of stormy sea, may be completed in the early summer, or by the end of June next ensuing. The interest which the public will naturally take in the fate of the first expedition, as well as in those which are going out to the rescue or relief of it, is our apology for this brief notice of a series of events not lying within the ordinary circle of our observations.

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In our Number of 22d May last, we briefly alluded to the subject of dispute between the North British Australasian Company and Messrs. Whitaker and Heale, as to the grant made by the late governor to the latter gentlemen, between high and low-water mark, on the Island of Kawaw. We have frequently been applied to for information on the position and prospects of this company, and we have also heard numerous complaints, by shareholders and brokers, as to the refusal of the directors to lay before them any particulars on this subject. We, therefore, consider it our duty to give our readers, and particularly those interested, all the facts that we can collect; and we would refer them to an article in another column, for the correctness of which we can vouch. It will be observed, as we formerly announced, that the Supreme Court in the colony annulled the grant between high and low-water mark to Messrs. Whitaker and Company, thereby apparently giving the North British Company full possession of the island. But the question has been appealed to the Privy Council in this country; and, whatever may be the result of that particular case, the Aberdeen Company are in great danger of losing their own claim to the Island of Kawaw itself. We cannot approve of the course being adopted by the Colonial Office as to the New Zealand land claims—many apparently *bonâ fide* transactions having been already upset by direction of the Crown.

We find that the grant, or purchase, of Kawaw is particularly alluded to in several of the late dispatches of the Governor and the Colonial Secretary. In a Parliamentary Blue Book, published this month, the Governor, Capt. Grey, remarks in a dispatch—"There is no doubt the island was illegally granted, and that it will be necessary for him to take immediate steps in reference to these disputes;" and again—"That he shall direct that an application should be made to the Supreme Court, *to order such grant to be annulled*," &c. The shareholders would do well to make themselves acquainted with all the particulars of this subject, as it very materially affects the value of the company's possessions, and they will find much correspondence on the subject of the land claims in New Zealand, in which their island is often alluded to as one for inquiry, and included among those in reference to which steps are to be taken by the Crown, in several blue books lately published.

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The question of the charge for the supply of gas is now become one of great interest, partly from the enormous amount charged by the London companies, as compared with our large manufacturing towns, totally incommensurate with the cost of coals in the north, and the price delivered in London. In our last week's Journal, we gave a notification of communications between the gas companies and the Government, on a proposed tax of 1s. per 1000 cubic feet of carburetted hydrogen. We certainly think nothing can be more fair than a tax on these wealthy companies, who, at present, in their collective capacity, subscribe nothing to the expenses of the State. We are no advocates for anything like excessive direct taxation on any article of manufacture, as always tending to limit the demand; but, when we see so excessive a surplus profit as 457,500*l.*, among fourteen gas companies, after payment of the proposed duty, and seeing there is not a great interest but what is heavily taxed by imposts, in addition to the Income-tax, we think such a tax would be but doing justice to the rest of the community. It will, probably, be urged that, in this statement, there is no allowance for wear and tear, casualties, and reconstruction of works; but, if we understand the matter right, this *surplus* profit is a reserve fund, after payment of the usual dividends, and adequate for all extraordinary expenses which may occur. That there is something rather more than usually lucrative in the manufacture and sale of gas may be inferred from the fact, that the companies' meetings are always kept close, and no reporters admitted, who would tell a few "secrets of the prison-house." We trust the Government will persevere, as, while every article consumed by the poor man is heavily taxed, those wealthy bodies go unscathed.

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We have alluded, on many occasions, to the progress making in steam navigation by British enterprise; and there is no doubt that, in a few years hence, we shall have steamers running from our principal ports to the most distant parts of the globe. This activity in the maritime and commercial industry has not only the effect of extending our relations with other nations, and causing an increasing demand for coal and iron at home, but giving an impetus to mining adventures throughout South America, India, Australia, and other British colonies, by the facilities it affords to transport their produce to the best market. The Peninsular and Oriental Steam Navigation Company has done a great deal towards this achievement by a regular line of first-rate vessels—24 in number—varying from 600 tons to 1800 tons, and 200-horse power to 520, running from Southampton to the different parts of the Mediterranean, Malta, the Levant, and Alexandria, and from Suez to Aden, Ceylon, the ports of India, Hong Kong, and China. It would have been looked upon as a chimera, little more than a quarter of a century ago, that it would be possible from England to reach Bombay in 35 days; Ceylon in 40; Madras, 45; Calcutta, 48; Penang, 46; Singapore, 49; and Hong Kong, 56. When the Austrian Royal Mail Steam-Packet Company, projected by the indefatigable Lieut. Waghorn, is completed—being incorporated by Royal charter, and sanctioned by the Lords of the Admiralty—the route will be performed as follows:—England to Singapore (8390 miles), 42½ days; Singapore to Port Essington, *viâ* Batavia (2060), 10 days; Port Essington to Sydney, *viâ* Wednesday Island (2340), 12 days—total, 12,790 miles in 64½ days, or at the rate of 199 miles a day. To our rising mineral colony of Australia, this line of steamers with the mother country will be most important, and cause the greatest development to mining enterprise and the prosperity of that promising portion of the British empire. We are glad to see that Government has announced that an arrangement has been made for despatching one of her Majesty's steam-ships on the first of every month to the western coast of Africa, calling at Maderia, the Cape of Good Hope, and Sierra Leone, as such a communication has long been a desideratum. Our colony of the Cape, and possessions in Western Africa, are well known to abound in excellent coal, iron, and copper, and even gold and silver exists to some extent—all of which have hitherto been entirely lost to human enterprise. A company is, however, forming to work the coal-field in the vicinity of Port Natal, which, no doubt, will lead to the exploring of the mineral of the colony by enterprising adventurers.

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The Steam Navy of France.—It is understood, that the new French Minister of Marine, the Duke de Montebello, has appointed a commission of experienced engineers, to examine into the state of machinery on board the Government steam-vessels, in consequence of the numerous accidents which have taken place to many ships, attributed to the imperfect state of the engines, working particularly irregular in heavy seas and squally weather, which may, in some measure, be attributed to the inferior quality of French coal, supplied under contract, corroding the boilers, and often rendering them useless. It is a fact, which some of the French journals have had the candour to acknowledge, that if the Government persist in employing exclusively French coal, to gratify the coal proprietors of the Loire, and support their monopoly, the steam navy of France will, in a few years, be so injured, that in the event of any sudden outbreak with any other powerful maritime nation, their ships would be quite ineffective to compete with their opponents. The report of the commission is looked forward to with intense interest by the public at large, and many expect it will never be made public. A large portion of the Chamber of Deputies have long endeavoured to impress upon the Ministers of Commerce and Marine, that a modification should take place in the import duties on British machinery, iron for constructing sea vessels, and coal; and, although promise upon promise has been made, many sessions have passed away, and no further notice taken on the subject. This has evidently arisen from the connection the Government party have with the iron and coal trades, and hence their interest in supporting the obnoxious monopoly.

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Canal through the Isthmus of Suez.—The following report of the progress of the surveys and preliminary works appears in the *Journal des Débats*. The letter is dated Nov. 11.—"There are 10 operators, geometers, and levellers. A first levelling has taken place at Cairo and in its vicinity, as well as at the Pyramids, and it has been joined to that of the Mekias of the island of Rouda. After this preliminary work, the expedition camped at Demerdache, opposite the camp of the pilgrims. His Highness the Viceroy has placed at the disposal of the chief engineer a company of soldiers of artillery, about 30 tents, and 120 camels. The central united, with the first division, immediately repaired to the Lake of Timsah. The lake and its environs have been levelled with the compass and the theodolite. In the meantime, the second division, which had remained at the gates of Cairo, advanced towards the central division, performing similar operations on the cultivated part, which limits the desert and all the Valley of Oundi. The junction with the Lake of Timsah was made on the 9th November, from thence one of the divisions went to the road of Pelusium, and the other to that of Suez—it is expected the surveys will be terminated by the end of the month. A very good service of camels, established between Cairo and the Lake of Timsah, which is the central point, affords means of procuring a very comfortable alimentation for the desert. The project of Linant Bey has been literally studied and put into execution—he has traced in Pelusium and Suez the places where he thinks it is proper the surveys should be made."

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Proposed Steam Conveyance through the Desert.—It is said that the Viceroy has listened to a proposal to start a steam-carriage in the desert, between Cairo and Suez, for the conveyance of the passengers between Europe and India. The projector imagines he can construct a steam-carriage of great power, and large enough to convey 100 passengers at a time, between Cairo and Suez, in five hours, the distance being 84 miles, and this without the aid of any rail or tram-road. Although there is so much sand in the desert, the track which is followed between the two points possesses a hard foundation, which enables the present conveyances, vans drawn by horses, to perform the journey, although large stones occasionally cause serious joltings. The Viceroy is said to entertain the plan of a steam-carriage, on account of the great destruction of the horses which annually takes place, and the wear and tear which naturally ensues from the total ignorance of the Arabs in the management of the coach and horse department. It remains to be seen whether the proposed plan will ever be tried.—*Query:* Would it not be better at once to make a single line of railway between Cairo and Suez, which would suffice for the double purpose of conveying both passengers and goods?

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The extension of the Midland Railway into the district bordering on Nottinghamshire and Derbyshire, by opening the Erewash Valley Railway, has brought this county into connection with the collieries of that vicinity, supplies of excellent fuel from which we are now being offered at the Lincoln station of the Midland Railway. The small amount of stocks from the north, owing to the great demand for freight of other kinds than coal, has rendered this supply still the more seasonable.—*Lincolnshire Times.*

## PROGRESS OF FRENCH MINING INDUSTRY.

[FROM OUR PARIS CORRESPONDENT.]

One of the most eminent coal merchants in this city informs me, that the present selling price of Belgian coal in Paris is about 43s. the French ton (the difference between the French and the English ton is not of any importance); of coal from the Valenciennes basin, 43s.; and of coal from the Loire basin, which is only used in forges, and in furnaces of steam-boilers, 40s. and 54s., according to the quality. "At what rate can you afford to sell English coal?" I asked. "At present," said he "we have none; but, at the beginning of the year, we shall have English coal at Paris."—"At what price?" "I don't know exactly," replied he; "but we calculate that, when the Boulogne Railway shall begin to convey merchandise, we can get it as cheap as, and even even cheaper than, the Belgian coal."—"And do you think it will sell as well as the Belgian?" "Ten times better; for, compared with the English coal, the Belgian is rubbish."—"But do you think that the sale will be sufficiently large to make it worth while for the English exporters to send their coal here?" "Certainly. Coal is getting into fashion now; and, at a moderate rate, the sale will be large."

Here, then, your readers have a confirmation of what I stated in my previous letters on the subject of bringing English coal to Paris. I hope it will satisfy them as to the practicability of the scheme. Indeed, that proof is hardly necessary; for as, in November last, two English houses offered to deliver coal, at *Marseilles*, at a shade less than 30s. 6d. the ton, it seems self-evident that coal can be brought to Paris *viâ* Boulogne, which is close to the English ports, for less than 43s. a ton. Unfortunately, I have not got by me, at this moment, the expense of coal at the pit's mouth in England, and of delivering it at Boulogne in English vessels, and cannot, therefore, give the items which would make up these 43s. Your readers must, therefore, make their own calculations. They will, of course, take care to allow liberally for the expense of bringing the coal on to Paris. On the Northern Railway, coal is charged 11 fr. the ton from Paris to Amiens; and it would be about the same from Amiens to Boulogne—the distance being equal; 3 fr. should be added for the octroi, and unloading at Paris—which would make 20s. the ton on this side the water, exclusive of the import duty. But, then, the two railways would make a reduction on large quantities of coal brought over regularly—for example, the Northern Railway allows a reduction of 4 per cent. on the conveyance of 1500 tons in a month. Can English coal, then, be delivered at Boulogne for 23s. a ton?—"That is the question." In answer to it, I repeat that there seems no doubt that an affirmative answer must be returned, when a contract was made, a few weeks ago, to deliver coal at Malta, Constantinople, Athens, and Alexandria—places at an immense distance, compared with Boulogne—at a few pence more than 30s. a ton. In saying this, I am aware that, with its usual absurdity, the French tariff makes the duty on the admission of coal at the ports nearest England higher than by the land frontier, and even than at the ports in other parts of the kingdom; and I am also aware that it is dearer, in proportion to the distance, to convey coal to Boulogne than to Bordeaux and Marseilles, seeing that from Boulogne the vessels have to go back empty, whilst at Bordeaux and Marseilles they can take in cargoes of wine, &c. But do not let your readers attach greater importance to those circumstances than they merit. Let them remember, that there is a great interest at stake—the interest of supplying the most populous district of all France with coal: a district with a population of nearly a million and a half, and which, in 1845, consumed nearly 400,000 tons of coal, though at that time it had not the advantage of railways. Besides, they must further bear in mind, that the manufacturers of Rouen are clamorous for a reduction of the import duties on English coal; and that it is by no means impossible that the Chamber of Deputies will accord it to them, notwithstanding that the Committee on the Customs Bill has, through its reporter, M. Lanyer, protested against it. And, next, let them not forget that, before long, Bordeaux and Marseilles will be united to Boulogne by railway—the consequence of which will, undoubtedly, be, to bring all the wines, and other products, of the south, with which France supplies England, to that northern port—so that, then, the vessels which bring coal to Boulogne will not have to go back empty.

I have now said enough on this important subject. No doubt, your readers will be prepared at the proper time to profit by it. If they do not they cannot blame the *Mining Journal*, for they must admit that it has given them timely information and warning. But, before leaving the subject altogether, I would just remark, that perhaps it is *not absolutely indispensable* for English coal to be *of the same price* as that of Belgian, to secure a large sale, *inasmuch as its quality is so much superior, that perhaps purchasers would not object to pay for it somewhat dearer.* It would, however, be most desirable, in every respect, to sell it at the same price, and even cheaper; and, in fact, that point seems to me so important, that if I were an importer I would willingly consent, if necessary, to a temporary sacrifice, in order to obtain it. One word more. Though I have hitherto confined my observations to the advantages of bringing coal to Paris, and the department in which it is situated; there is, in reality, a much wider field opened up to English exporters, by the Boulogne, Dieppe, Northern, and other railways. These are, in fact, not only all the departments through which those railways pass, but which are within easy reach of them. In the following departments, in particular, the consumption of English coal may be expected to increase greatly:—Calvados, with a population of upwards of 500,000; the Eure population upwards of 450,000; Eure et Loire, 300,000; Marne about 380,000; Nord, 1,000,000; Oise, 400,000; Pas de Calais, 700,000; Seine et Marne, 350,000; Seine et Oise, 500,000; Seine Inferieure, 750,000; Somme, 600,000.

The following official statement was drawn up some months ago by the coal trade of Paris, to show the enormous expense of bringing the coal of the Loire to the capital:—Price per *voie* of 1200 kilogrammes at Andrezieux, coal for forges, 14 fr.; for steam-furnaces, 16 fr.; conveyance to Paris, 29 fr.—29 fr.; octroi, 4 fr. 95 c.—4 fr. 95 c.; conveyance to the residence of the purchaser, and profit of the tradesmen, 7 fr.—7 fr.: total, coal for forges, 54 fr. 95 c.; for steam-furnaces, 56 fr. 95 c. The cost of the coal at the mine was 10 fr. 50 c.—so that a quantity of coal, costing 4*l.* at the mine, would be upwards of 20*l.* 10s. delivered at Paris! A few years ago the cost of bringing coal to Paris was even more enormous—the selling price having been 36*l.* for a quantity which had cost 4*l.*

The following observations, extracted from the *Report of the Committee on the Customs Bill*, are interesting, from the bearing they have on the question, which we have been discussing. In giving them, I do not think it worth while to refute them, for your readers will see that they are rather shallow, though fiercely monopolist:—"Rouen claims a new reduction of the import duties on foreign coal. The industry of Rouen, protected by prohibition, attacks the system of zones, which were precisely established and maintained for the sake of equality. The duties on coal were diminished in places, in which they arrived with difficulty, and at great cost, from the interior. It was endeavoured to preserve its peculiar industry to each district as much as possible, and place production and consumption in analogous positions. The accomplishment of the wish of the city of Rouen, would extend the district in which a struggle has become impossible—would prevent French coal from arriving even in the centre of the kingdom, and would deprive them from all the basin of the Seine. [They will do that, by the way, without any reduction of the duty.] The lowering of 30 to 20 per cent. would serve to pay the freight of the English coal beyond the district, which exclusively belongs to it at present. And what would the city of Rouen gain by the reduction, which it demands? The coal consumed annually in Rouen, and its suburbs, is estimated at 150,000 tons. A reduction of 22 per cent. (the *decime* comprised) on the 55 c., the present duty per quintal on English coal, would produce a difference of about 12,800*l.* This reduction would evidently have no effect on a branch of industry, which sells annually 2,400,000*l.* of its products. It must not be forgotten, that French branches of industry are dependent one on another, and that this dependence constitutes the surest guarantee for all. In 1837, the Customs duty on the import of coal was reduced. What was the consequence?—a considerable increase in the foreign importation. This importation, in 1837, was 110,000 tons, and the native production was 300,000 tons. In 1845, the foreign importation rose to 200,000 tons, and the native production to only 400,000. Thus, in the space of eight years, the importation has increased nearly 100 per cent.; whilst the native production has only increased 35 per cent. Do not these figures suffice to prove, that the French coal-pits can only sustain competition under certain conditions?—and that a reduction of one-half in the import duties, during the last 10 years, has not permitted them to maintain that proportional part in the consumption, which they occupied previously? From that, we may conclude that, in certain cases, they cannot support the suppression of these duties. It must be remarked, besides, that in 1837, England only imported into France 200,000 tons of coal, and that in 1845 the English importation was 600,000 tons; whilst the Belgian importation, which was 800,000 at the first date, was only 1,300,000 eight years later. The Belgian, therefore, only increased five-eighths; whilst the other, in the same period, increased three-fold. A new reduction could not be effected on Belgian coal, without being equally applied to English coal. This reduction would be especially profitable to England, which, by the wealth of her mines, and the extent of her navigation, would become absolute mistress of the coal industry of France, and possess herself of our principal markets." "And, what for no?" I would ask, in the words of the venerable Mrs. Margaret Dods, of St. Ronans, if the French coal-pits cannot supply the country, without imposing a heavy tax on the people.

The Navy Board advertises that, in the course of a short time, it will receive some large contracts for the supply of sheet-iron, &c., to the different dockyards.

It is really surprising to see how cast-iron is coming into use every day. An immense public conservatory, constructed in iron, has just been opened, and a vast prison is in course of construction, in which iron, as far as possible, is substituted for wood. Of the extent in which it is employed in house-building you are already aware. And yet the ironmasters will not hear talk of a reduction of the import duties!

A vein of coal, of great richness, is stated by the newspapers to have been discovered at a place called Petite Roselle, in the department of La Moselle.

The semi-official organ of the Government promises that a measure, for the reduction of the duty on salt, will be presented early in the coming session of the Government. Such a concession has been demanded for years past by the whole nation.—*Paris, Wednesday.*

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BELGIUM.—Beds of iron ore have been discovered in different parts of Flanders. The discovery is considered of great importance to that distressed province.

The directory of the Sars-Longchamp et Boury coal-pits calls on the shareholders to make known the number of their respective shares, that payment of the dividends may be made to them at the beginning of 1848.

Crosses of the Order of Leopold have been conferred on the chiefs of the principal metallurgic establishments, who made the most remarkable exhibitions of their manufactures at the recent exposition. Many of their workmen have been honoured with medals.

Nothing new with respect to the coal district of Mons; but it may now be safely assumed, that the Government means to do nothing.

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## MINING IN NEW ZEALAND, KAWAW, &c.

Within the last five years, two entirely new fields for mining speculations have been opened. By far the most important, for the present, is South Australia, much information relative to which has, from time to time, been recorded in our columns. Of the other much less is known; but a promising commencement has been made, in the discovery, and even proof, of mineral lodes. Although it can hardly be even hoped that New Zealand, in this respect, should ever rival South Australia, yet the former appears to us to possess advantages peculiar to itself. What discoveries have been made, are situate on the sea coast, thus rendering them easy of access, and saving all expense of land carriage.

Operations have been carried on, at present, in three places only to any extent:—1, at the Barrier Island, situate in the gulph of Houraki; 2, on the island of Kawaw, in the same gulph; and the last appears only to be workings commenced between high and low-water mark on the same lode, and carried on under the sea, at a short distance from the second. During the last five years, a considerable number of tons of copper ore have been sent to Swansea from the Barrier, some of which have realised a high price, and some but a very low one, for foreign ores. We cannot hear that operations, on any extensive scale, are being carried on there now, but we believe they have not wholly ceased. It was contemplated to form a company in England, but we are not aware that any progress has been made, which is to be regretted, as, judging from what has been done, the prospects would appear to be good.

The island of Kawaw was purchased by Mr. Beattie, the agent of a company in Aberdeen, direct from the natives, and was the subject of one of the old New Zealand land claims. The late governor, Capt. Fitzroy, made a crown grant to Mr. Beattie, the claimant, on the part of the company. About four years ago, a lode of copper was discovered, and soon after works were commenced on it, which have been carried on ever since. About 1500 tons of ore were raised up to the end of last year. Like the Barrier ore, some has fetched a high and some a low price; the average has been near 12*l.* per ton.

The site of the third workings, extending seaward from high-water mark on the island of Kawaw, was granted by Capt. Fitzroy, the governor, to two gentlemen in the colony, in exchange for some land required by the Government. Mining operations were commenced more than two years ago, but they have now been suspended, in consequence of the apparent invalidity of the title. About 400 or 500 tons of copper ore have been raised from this mine, averaging about 10*l.* a ton. Although these three places comprise all where works have been carried on to any extent, and have satisfactorily proved their value, there are, in several places, very promising surface indications; but little or no attempt has been made to prove them by a sufficient investigation.

New Zealand miners, however, like all New Zealand colonists, have had, and indeed still have, their difficulties to contend with; that most ruinous question as to land titles, has extended itself to the mines. The Barrier was one of the original land claims, having been purchased before the colony became British, and, as such, was the subject of doubts and difficulties for years, which have, however, we believe, now ended satisfactorily to the claimants. The title to the island of Kawaw, as another such claim, was investigated, it appears, by the commissioner appointed by the Crown for that purpose, who reported against it; but Capt. Fitzroy, the governor, made a grant, which is now held by the North British Australasian Company (Kawaw). Their title, however, is now disputed by the natives and the Crown. In a Parliamentary Blue Book, published this month, there is a dispatch to this effect from the governor, Captain Grey, in which he adds, that "there is no doubt the island was illegally granted, and that it will be necessary for him to take immediate steps in reference to those disputes;" and "that he shall direct that an application should be made to the Supreme Court, to order such grant to be annulled," &c. The grant of the remaining mine—that on the sea-beach—has already been called in question by the Crown before the Supreme Court, and declared invalid. An appeal was entered to the Privy Council in this country, and here the matter appears to rest for the present.

Such is mining in New Zealand. Copper exists in several places, and could be worked profitably; but the state of the land titles there has prevented any satisfactory progress. In two cases, uncertainty as to the ownership still exists; but, whoever may ultimately be the owner, property apparently so valuable can hardly be allowed to remain idle for any length of time. At all events, we hope no more to see the colonial papers reporting disputes in the courts, such as have occurred between the Kawaw Company and their neighbours. Such disputes could not but be injurious to both parties; and, in such cases, if an amicable understanding could be come to, without injury to either, both must be gainers. The only question litigated, appears to have been one of boundaries; and why could not this have been arranged without the intervention of a court of law.

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MINING IN NEW ZEALAND.—Extract of a private letter from Sydney, dated July 20—"As a piece of local news that will be interesting to you, I may mention that enormous quantities of lead ore have been discovered at Yass. I have seen several specimens, which consisted of, I should think, 90 per cent. of metal—the ore is said to contain a considerable per centage of silver. Since this has been made known, there has been a sort of mania for finding minerals; every man has a hammer in his hand, and, strange to say, metals of various kinds are being discovered almost daily in different directions—copper at Lake George and Goulburn, at Yass and Wellington-Valley. It is difficult to say what may eventually be the effect of the working of mines in the colony. The most sanguine expectations are at present indulged in."

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MACHINERY (CUBA AND BRAZIL).—A return (moved for by Mr. Goulburn) shows, that the declared value of machinery and mill-work exported to Cuba from this country, was 6572*l.* in 1844; 4807*l.* in 1845; 16,200*l.* in 1846; and 17,664*l.* in 1847. The declared value of the same articles exported to Brazil was 17,505*l.* in 1844; 17,130*l.* in 1845; 19,091*l.* in 1846; and 35,128*l.* in 1847.

STATISTICS OF STEAMERS.—Lord G. Bentinck has just procured a return to Parliament of the total number of steamers which entered the ports of the United Kingdom, from France, Holland, Belgium, in the year 1846, including their repeated voyages. It appears that the number of voyages from France was 1651 (tonnage, 228,189); from Holland, 379 (tonnage, 82,193); and from Belgium, 470 (tonnage, 77,931).

## MINING IN SOUTH AUSTRALIA.

The accounts as to mineral discoveries and mining operations, received by the last Overland mail, from this country, continue to be highly favourable. Another copper mine has been discovered in Yorke's Peninsula—the land between St. Vincent Gulf and Spencer Gulf—a district altogether distinct from those in which all the other mines, except the one near Mount Remarkable, are situated; and, while the latter is on the eastern shore of Spencer Gulf, the recent discovery is on the western shore of St. Vincent Gulf. The ore is said to be decidedly rich and abundant; while the proximity to Port Adelaide, and facility of water carriage all the way, render the mine peculiarly valuable. Capt. John Hart and Mr. Weaver were the fortunate purchasers. The governor has visited the place since the sale; and confirms the favourable report of the mineral indications.

The KAPUNDA Mine has not been worked for some time extensively, as machinery (steam-engine, &c.,) was required; it had now arrived. Mr. Francis Dutton, one of the fortunate proprietors, had also got out, having returned from a visit to his friends in England. The operations are likely to be immediately resumed with great effect.

The directors of the BURRA BURRA Mine have advertised a third dividend; the two former were, each, 50 per cent. on the capital paid up, while the third dividend was *one hundred* per cent.—thus repaying the shareholders the amount of the paid-up capital, besides giving them a bonus to the same extent. The 5*l.* shares were selling at 120*l.* (and difficult to be purchased at that price), being 2200 per cent. advance.

The accounts of the KANMANTOO Mines are more particular, and highly satisfactory. These mines are inspected monthly, by Capt. Rodda, who lately recommended the manager to "drive north and south, at a 12 fm. level, on the course of the lode, for at least 10 fms. each way; when this is done, then sink winzes on the lode, 10 fms. from shaft, down to a 22 fm. level, and then communicate"—giving it as his opinion (which is entitled to great respect), that thereafter they would be able to employ 32 men, who, if the ore continue, would raise 300 *tons per month.* In some other parts of that valuable property the ground has been opened, and worked to a considerable extent: the ore is very rich in quality.

By recent accounts, a fresh discovery of copper ore had been made in the neighbourhood of the Kanmantoo Mine—which, on an excavation of only five feet, showed the most promising appearances of any lodes yet discovered on the South Australian Company's lands.

The favourable appearances at the Reedy Creek Survey, belonging to the Australian Mining Company of London, are becoming more decided—so that we hope that property, also, will soon come into active play.

The *verata questio* of the royalties is understood to be abandoned, as no further proceedings had been adopted against the party who so manfully refused to make any return to the authorities of the quantity of ore raised, on the ground that the proposed imposition of royalties was unwarrantable.—No sooner, however, had the governor, in council, got out of that false position, than he ran into another, and gave intimation of his intention to reimpose the port-dues. The wise measure of declaring Port Adelaide a free port had been approved by the Home Government, and was working very well for the colony; but his excellency expected it would have worked more promptly; and, therefore, in the plenitude of his legislative wisdom, he gave notice of his intention to re-impose the port-dues, and, in the course of the discussion which followed in the council, he charged the unofficial members with having acted dishonourably. This was too much for gentlemen to submit to at the hand of her Majesty's representative—so that his excellency has not only had to make the *amende honourable* to these gentlemen, but relinquished his intention of re-enacting the port dues, excepting a charge for pilotage, to provide for the expense of a steam-tug, which is to be stationed there, for the use of the vessels; and even as to the charge for pilotage, it is to be exacted only from those captains who *choose* to avail themselves of the services of the pilots.

On the whole, it is a happy thing that his excellency, Major Robe, is so soon to be relieved of the care of the government of South Australia. May his successor learn wisdom from the major's blunders.

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AUSTRALIA.—Australia has an importance in the eyes of England superior perhaps to all her other colonies. The climate is obviously more fitted for the English frame than that of Canada or the West Indies. The English settler alone is master of the mighty continent of New Holland, for the natives are few, savage, and rapidly diminishing. The Englishman may range over a territory of 2000 miles long, by 1700 broad, without meeting the subject of any other sovereign, or hearing any other language than his own. The air is temperate, though so near the Equator, and the soil, though often unfertile, is admirably adapted to the rearing of sheep and cattle. The adjoining islands offer the finest opportunities for the commercial enterprise of the Englishman, and its directness of navigation to India or China, across an ocean that scarcely knows a storm, gives it the promise of being the great eastern depôt of the world. Van Diemen's Land, about the size, with more than the fertility, of Ireland, is said to resemble Switzerland in picteresque beauty; and New Zealand, a territory of 1500 miles in length, and of every diversity of surface, is already receiving the laws and the population of England.—*Blackwood's Mag.*

THE MINES OF MEXICO.—The gold mines known as the Placere are in the chain of mountains east of the Rio Grande, and south-west from Santa Fe, the old Placere, distant 27 miles, and the new Placere about 40. They have yielded large amounts some years, and are fully as productive now as they have been at any time; in fact, there is no telling the riches they contain. The gold mine district is at least 15 miles long, including the old and new Placere, by several in width, the whole of which yields this precious metal. The mineral is procured in different ways, but much the larger portion by washing the dirt, in all of which gold is found. It is as rich on the surface as any place, and they have no where gone more than 50 ft. in depth, the soil at that depth being of the same kind. In some places it is found in flint rooks, which is pulverised, and the mineral gathered with quicksilver, and at one place this method was adopted with the dirt, the dust being too fine for washing. It is often found in large lumps, the largest yet found weighing 7¾ lbs.; it is common to find 12, 15, 20, or 30 ozs., and considerable silver is mixed with all, and some copper. A vein, or lode, as we say in the States, is here called a *helo*, some of which are deposits, forming strata of sand, gravel, dirt, and gold. There is no regularity in mining, the winter season being the time principally devoted to it, on account of the scarcity of water at other seasons of the year. The number of hands engaged varies very much, seldom exceeding 500, and as low in the summer as 40 or 50. The miners receive a certain amount in money or goods for all they procure, and usually leave when their immediate wants are supplied. The town of Placere is a small, dirty, ill-built, place, furnishing temporary habitations, principally for the workmen; and a few merchants who are interested in the mines buy the gold procured, and trade with the washers and workmen. Besides gold, there is a rich vein of copper in the mountain, which can be traced entirely through, but it has never been worked, though claimed as private property. The road from this place to the town is a good one for waggons, and so is the one to the river, from which the mines are about the same distance they are from here. The mountain is covered with pine timber, some of which is large; and cedar is also abundant. A good road passes by Placere from this to Peralto, Valencia, and Toma, on the river to Albuquerque, where provisions can be procured, and which is the richest and best cultivated part of New Mexico. In the hands of enterprising capitalists they would, no doubt, yield large profits and amounts; the only difficulty being the scarcity of water for washing, which it is thought can be procured by sinking shafts, and using small engines to pump it up.—From the *Santa Fe Republican, Sept.* 24.

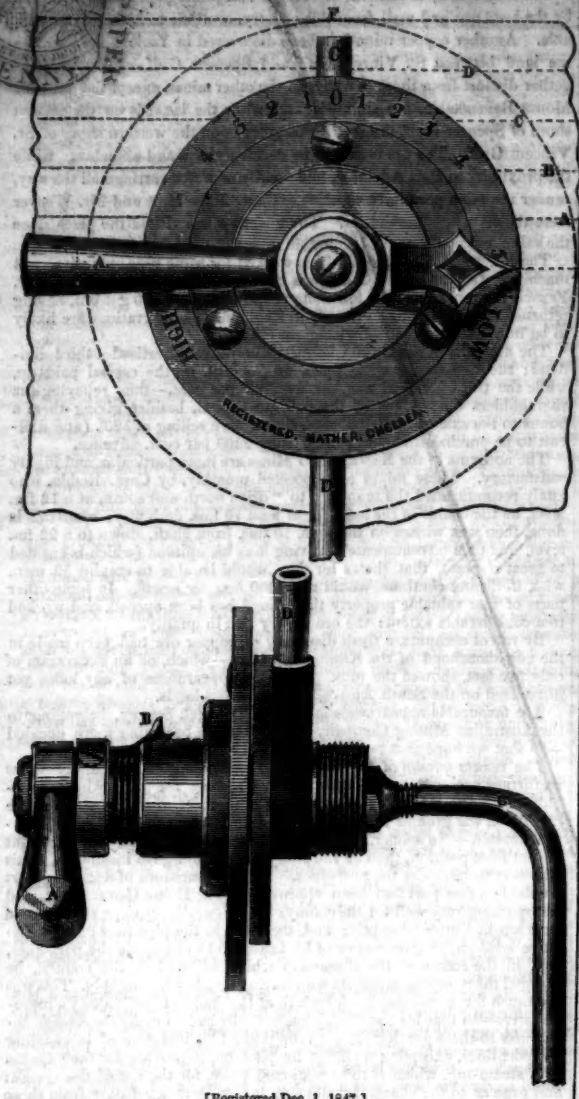
DEPRESSION OF LAND AT NAPLES.—A remarkable fact was mentioned, in a letter read at the Geological Society, on Wednesday last—viz.: that at the hospice of the Capuchins, between Naples and Pozzuoli, the water is now so high as frequently to cover the floor of the building, between which and the sea there was formerly an extensive vineyard; and an old monk has frequently eaten grapes which grew on a spot where boats are now sailing.

ROTARY ENGINES.—In our Journal of the 18th inst., we gave an account of a new description of rotary engine by Messrs. Dunham and Co., of New York, wherein there is an allusion made to another engine—the invention of Mr. Macintosh—a full description of which was first given in our columns on the 22d of May last. This singular engine is now completed; and will, we are informed, be tested in a few days, when we shall give a report of the experiments.

STEAM-GAUGES.—We have received a communication from a Mr. Page, of Nottingham, the purport of which we cannot well understand. After alluding to Mr. Baker's improved mercurial gauge, he says, he always adjusts his by weights and scales; and if Mr. Baker has a better plan of proving the pressure of steam than by weights and scales, it might be *useful to the public as a weighing-machine.* This is perfectly paradoxical—we do not understand it.

NASMYTH'S STEAM HAMMERS.—The Nasmyth hammers in the new building recently erected adjoining the blacksmith's shop in the Woolwich Dockyard were worked, on Monday last, by steam, and answered the purpose for which they were erected, welding bars and old iron remarkably well; the men, by the aid of the machinery, having a complete command of the stroke of the hammer from the power of a few ounces to about 18 tons. There are five hammers of various sizes in the building, and the forges have a powerful draught for bringing the iron to a welding heat.

## J. MATHER'S IMPROVED REVOLVING WATER INDICATOR.




[Registered Dec. 1, 1847.]

The advantages of which, over the common gauge cocks, are—1. Its simplicity of construction.—2. Less liable to corrosion, or derangement, in any of its parts—also, less expensive, and more easily applied.—3. Being able to tell the exact quantity of water in the boiler, as shown by the dotted lines on *fig.* 1, by the handle, A; move the pointer, B, to O, the tube, C, will be on the water line at 5; and, if the water be at that point, it will be shown, by coming through the tube, D; or, if steam be there, it will be shown in like manner. So on will be shown, or indicated, the rise and fall of the water in inches, by moving the pointer to 1, 2, 3, 4, 5; the tube, C, will be at the points, A, B, C, D, E; and, as before stated, indicate whether water, or steam, be at those points. After the quantity of water is ascertained, place the handle, A, horizontally, and the communication is shut off, until again required—whereas, with the common gauge cocks, which are generally placed 3 in. apart, it cannot be ascertained, whether the water has just left the upper cock, or is close upon the lower one—consequently, the exact quantity cannot be ascertained, excepting when at the cocks. The inventor of the above water-gauge does not presume entirely to dispense with the glass gauge cocks now in use, particularly when they can be applied with advantage and safety, which is not generally the case—for it is well known, that accidents are frequently happening, in consequence of the glass tube breaking, from a variety of causes, which renders them, in a degree, dangerous to those engaged near them; in all cases, other gauges are fixed to the boiler—such as the three cocks, and other contrivances; amongst them is the common float, which is pretty generally used. This is a clumsy and expensive machine, having a constant leaking, and a tendency to stick in the stuffing-box, which the wires pass through. The three cocks are subject to these faults—not only from leakage, but from the number of holes made in the boiler, and the impossibility of knowing the exact situation of the water between them. The improved revolving gauge obviates all these defects—it requires but one hole, and can be attached to any shape of boiler. It affords every facility for getting to its working parts, or facing, which can be cleaned and reground, if required, without either running the water out of the boiler, or moving the man hole. The extreme simplicity of this gauge brings it within the reach of all persons having boilers, as regards cheapness; and, at the same time, is ornamental, and gives a finish to the boiler.

## INTERESTING STATISTICS OF THE UNITED STATES.

| | |
|---|---|
| Specie in the country on the 30th Sept., 1820, was | $ 20,000,000 |
| Ditto imported since then, to 30th June, 1846 | 221,684,605—241,684,605 |
| Deduct export to same date | 162,425,779 |
| Leaving on hand, 30th June, 1846 | $ 79,258,826 |
| Estimated net addition, from 30th June, 1846, to 1st November | 20,000,000 |
| | $ 99,258,826 |

Or say, in round numbers, $100,000,000.—In this calculation, the production from the mines in the country, and also what is imported by emigrants, is set off against the amount lost—manufactured into plate, jewelry, &c.; but this, it is said, is probably too liberal an allowance—that is, the amount added from the two sources mentioned, is probably greater than the amount subtracted by consumption and loss. Consumption of cotton by manufacturers, in the United States, is 800,000 bales, of 450 lbs. each; sugar, 250,000 hhds., or 130,000 tons—averaging about 2 tons per acre. In corn, 600,000,000 of bushels, or 75,000,000 quarters—valued at 73 to 76 cents per bushel—is 112,500,000/.: 60,000 tons railroad iron was manufactured in 1846.

ARTIFICIAL QUARTZ.—At a meeting of the Paris Academy of Sciences, on the 6th inst., M. Ebelmen submitted some beautiful specimens of artificial quartz. It is known that pure silicic acid constitutes one of the minerals the most remarkable for its transparency—viz., quartz—but, in general, a large proportion of foreign matters gives a colour to this substance, and renders it opaque. Chemists have long known how to clear the silicic acid of the impurities by which it is deteriorated; but they have only been able to obtain an opaque jelly, which does not at all resemble the natural and diaphanous production. M. Ebelmen was the first to obtain, by artificial means, a perfectly-transparent substance. He does this by exposing to the action of a moist atmosphere the combination of silicic acid and ether, called silicic ether, and which substance was also discovered by M. Ebelmen. This mass contracts and hardens gradually. At the end of two or three months, it is transformed into a substance sufficiently hard to cut glass, as transparent as glass, but not crystallised. It is now about two years since M. Ebelmen made these facts public; since that time, he has been able, by repeated experiments, to render his products more perfect, and again presented to the Academy specimens of much larger dimensions. Amongst them are some to which he has given various tints, by mixing colouring substances with the silicic ether. The specimens, impregnated with chloride of gold, are very beautiful. At the end of a certain time, the chloride is decomposed, and streaks of gold appear in the entire mass. The decomposition is accelerated by the action of the solar light; and, under its influence, also bright colours are obtained—sometimes blue, sometimes red, and at other times violet. By a modification of this process, M. Ebelmen obtains a true natural mineral—the *hydro-phane*. It is a siliceous, porous, and opaque substance, which becomes perfectly diaphanous as soon as it is plunged into water. M. Ebelmen has ascertained that this substance absorbs gases as powerfully as does charcoal.

# Original Correspondence.

### CENTRAL HEAT.

SIR,—The arguments adduced by Mr. Lyell, in attempting to controvert the doctrine of central heat, are of the most fallacious nature. What analogy can subsist between a crucible, however large, *surrounded* by ignited matter, and inclosing a homogeneous mass in a state of fusion, and the earth, moving in space, and subject internally to the laws of gravitation, and to electro-magnetic influences, about which very little is known, and still less understood; whilst, in this latter instance, a cold and hardened crust of matter, infinitely varied in its component structure and material, encloses a nucleus of intensely-heated matter. Admitting for a moment, that the deduction, from Mr. Daniel's experiments, is valid when applied, as Mr. Lyell says, to quantities of matter, however great, when entering into fusion—then, since the ocean is a vast quantity of fused ice, and since vast quantities of ice are at this moment dissolving, or undergoing fusion therein, and have been thus dissolving for ages, it follows that the temperature of the ocean cannot be raised one degree above the melting point of ice—that is to say, it cannot be higher than 33°. But this is a palpable absurdity; and, *a fortiori*, the theorising of Mr. Lyell, built upon this frail foundation, is palpably absurd. Hear, now, the *Westminster Review*, in its *able support* of this false reasoning, drawn from the crucible. Within the tropics, says this authority, the temperature of the ocean diminishes, from the surface downwards, at the mean rate of 1° in 25 fms. Taking this as an axiom, and supposing the temperature of the sea in the tropics to be 80° at the surface—a very liberal estimate—it follows, that the temperature, at a depth of 1200 fms., will be 32°—*i. e.*, at the freezing point; and at 2000 fms. the temperature must be at zero. Hence, all the water at a greater depth than 1200 fms., must exist in the state of solid ice; but, by Mr. Lyell's principle, the water in which this ice is undergoing fusion *must be* at the melting point of ice, within 1°—that is, at less than 33°—an absurdity which needs no refutation. Such are the contradictory puerilities advanced by the philosophers of the age, to controvert the opinions of the great Leibnitz, who was second only to Sir Isaac Newton, in power of intellect, and in the justness and accuracy of his conclusions. Mr. Lyell goes on to suppose, that the globe should be composed of water and ice only, and then proceeds to reason against central heat, upon the deductions drawn from this hypothesis; but here, again, there is no analogy, for the specific gravity of the planet would, in that case, be less than 1·000; whilst, as the planet really exists, its specific gravity is more than 4·000. A misapprehension of the nature of imponderables seems to constitute the *lapis offensionis* of the opponents of central heat. Heat and other imponderables are, I consider, fluids or gases, which are not subject to the influence of gravitation; and they may, therefore, be added or substracted in large quantities from gravitating matter, without any increase or diminution taking place in the weight of a given magnitude of that matter. Imponderables are matter, but they are obedient only to the laws of electricity, and not to those of gravitation; when the former laws are as well known as those of gravitation, it may cease to appear surprising, that a nucleus of heated matter should occupy the central regions of the earth for ages, without loss from radiation, or increase from electro-chemical action.

The magnetic power will raise iron, but it will not lift lead—hence, in a state of existence, when magnetic power supplied the place of gravity, lead would be an imponderable, and, at an intense temperature, it would probably exist as a subtile and invisible gas. If the imponderables—heat and light—were obedient to the force of gravity, they would, from their extreme subtility, be instantaneously drawn by that force into the body of the earth, and neither of them could then produce their present beneficial effects; or, if subject to the same laws as the lighter gases—such as hydrogen—they would rise to the surface of the atmosphere, or, at least, to that height, when the rarity of the latter indicated a medium not denser than the ascending gas. I should much like to see a rational explanation of the phenomena of volcanoes and earthquakes, rendered by an opponent of the doctrine of central heat. Volcanoes and earthquakes are so intimately connected, that an explanation of either ought to elucidate both. The electrical theory of earthquakes does not explain the phenomenon of volcanic action.—ROBERT MUSHET: *Coleford, Dec.* 21.

### PROPOSED CAST-IRON CELLULAR FOUNDATION FOR A LIGHT-HOUSE ON THE GODWIN SANDS.

SIR,—For many years past, there have been various attempts to erect a permanent beacon on the Godwin Sands, all of which have invariably failed. The requirements, however, of the great commercial interests of the kingdom, forbid the subject being given up in despair; and, in consequence, the attention of engineers, and other scientific persons, has been constantly employed in endeavouring to solve the difficulties of the problem connected with so great a desideratum. If the following remarks, or suggestions, should, in your judgment, be at all likely to prove *useful*, or tend to the ultimate production of *practical* results, it will be a great satisfaction to me, if you will insert them in your widely-influential Journal. In the structures hitherto attempted, it seems to have been a principle, that a sufficiently secure foundation might be obtained, by merely sinking a certain depth in the sand *alone*; facts, however, have shown this principle to be incorrect. The next step has been a proposition to excavate an area, of sufficient extent for a structure 90 ft. in height, to the depth of the solid rock, and fill in the excavation with concrete. This, however, apart from the great practical difficulties necessarily attending its construction, and only to be surmounted at great cost, is also open to further objections of an after consideration. It is well known that, in heavy storms, these sands are one mass of agitation, often, also, being wholly shifted considerable distances; at these times, therefore, when most requisite, the concrete foundation could receive no other *lateral* support, to resist the united shock and vibration, occasioned by the beating of the sand and waves against the heavy and lofty structure resting upon it, than a thin wrought-iron boiler plate casing. It is hardly possible to suppose, therefore, that a body of concrete, so supported, merely could alone resist the union of all these forces—especially, when it is remembered, that its thorough homogeneousness is, at the best of times, always a matter of uncertainty, and much more so in the situation under consideration—at any *rate*, there are *chances* connected with it, which it would be prudent to avoid. I think, therefore, that the foundation, which is intended to be *permanent* in this situation, must be dependent for its security neither upon the sand nor the surface *merely* of the chalk rock, but must be *firmly rooted into the rock itself*. The method to be adopted for the carrying out of this principle, would be to sink a hollow cast-iron pile (say) some 7 ft. in diameter, by Dr. Potts's pneumatic process, to the level of the top of the chalk. Additional lengths should then be affixed, to the extent of the depth proposed to be sunk into the rock; and a close cover being fitted over the top, as in the pneumatic process, by means of air-pumps, the pile should be converted into an immense diving-bell—then, by an arrangement of doors and shutters of easy detail, operations could be carried on within the interior, by which a well could be sunk immediately under the pile, and the whole gradually lowered to its required depth. If it should then be decided to have a beacon light merely, this pile, filled with concrete, to give it additional weight, would be an ample and secure foundation. If, however, a lighthouse, of an extensive range, should be thought advisable—and such the interests involved seem to demand—an enlarged foundation would become necessary. For this I would propose the following method:—On the outside of the centre pile, already described, dove-tail slides should be cast; around this there should then be sunk, by the pneumatic process, a complete casing of cast-iron piles, about 4 ft. by 5 ft. scantling, and six or eight in number, provided with grooves, so as to dove-tail into the guiding slides, furnished for that purpose. These piles should not be circular, but square—so that each should fit to the other, without allowing any vacant interstices. The radiating joints should all be flush up like those of an arch, and the sides cast to the circular sweeps, so as to make the whole one dove-tail mass. These, when filled with concrete, would be so far complete. Other rows of piles could then be proceeded with, to any extent, in the same manner, taking care only, as an additional security, that in the row intended for the outside, alternately, or at certain distances, the piles should be sunk, as described, for the centre one. By this means, a foundation would be provided, which nothing short of the entire dislocation of the chalk bed could ever remove, and similar in principle to a vast cast-iron tooth, of the strongest cellular construction, firmly flanged into the rock. This plan, though it might be attended with considerable outlay in the first instance, could be subject to no uncertainty—a point of great engineering importance—each part, as proceeded with, forming an addition thoroughly complete in itself, and dependent for support upon no *temporary* structure, until the final closing of the whole. It is not to be supposed, however, that in so great an undertaking, occasional derangement might not occur to the apparatus; but as this would be light, and involve no injury to the permanent work, it could be easily repaired. I feel, that an apology is necessary for requesting the insertion of the above in a paper, in which it may be considered by some as out of place. I know, however, of no other by which the above suggestions can be so early, or so widely, circulated amongst a thinking and intelligent class, by whom *practical* results are most rapidly produced.—M.: *Wolverhampton, Dec.* 11.

### IMPROVEMENTS IN THE CONSTRUCTION OF LIGHTHOUSES.

SIR,—Your correspondent, "Terro-Nauticus," in last week's Journal, seems to think my plan for erecting a lighthouse on the Godwin Sands an exceedingly good one, so far as it goes, and certainly has not suggested any improvement on the original principle. "Terro-Nauticus" proposes to drive a treble row of piles to form an enclosure—I presume he means a coffer-dam. Now, surely he must be a mere novice with regard to the constructions of coffer-dams, or he never would have hazarded such a suggestion. He then proposes to take out the water by means of powerful pumps. Now, Sir, it is evident that, to prevent the external water from rushing into his coffer-dam, each row of piles must be 6 ft. apart, the sand taken out from between each row to the chalk, and each space filled in with puddle, which process would be a very treacherous one, even when completed, as the smallest orifice, or vent, between the piles would bring into his supposed enclosure more sand and water than the pumps and workmen could excavate. My method is intended altogether to exclude the external sand and water from penetrating into the foundation. With respect to his remarks on the sand leaving a chasm, and pushing over my cylinder with attached piles, external piles, bracings, concrete, &c., &c., I consider that the plan proposed by "Terro-Nauticus" would be far more liable to that danger; and, as regards his commencing at eight points to drive the piles, I should commence at 16 points, if possible. In fact, Sir, I see nothing in your correspondent's letter which is not borrowed from my communication of the 27th ult., except his treble row of piles; and I certainly consider that "Tyro-Nauticus" would have been a far more appropriate name for him to assume. In conclusion, I beg to remark, that my plans for erecting lighthouses and beacons on sands and such dangerous places, will shortly be laid before the public; and I have confidence in stating that, for strength, economy, and durability, lighthouses constructed on my principles will resist the buffetting of old Neptune in the severest and most exposed places on the coast. G. SHEPHERD, C. E.

*Fleet-street, Dec.* 22.

### LIGHTHOUSES ON THE GODWIN SANDS.

RESPECTED FRIEND,—I suppose "Terro-Nauticus" must be somewhat of a tyro in nautical affairs, or he would not have proposed such a curious amendment to the plan of G. Shepherd, C.E., for constructing a lighthouse on the Godwin Sands. The principle of his plan is certainly the same; but why a cylinder, composed of iron tubes, should be stronger than if made on shore with iron plates, is incomprehensible? The tubes might protect the cylinder; but this would be at an immense expense—while, if the cylinder was composed entirely of iron tubes, "Terro-Nauticus" would find, on excavating the sand from the enclosed space, that they would be driven in the cavity as rapidly as air will rush in a vacuum, as the sand in which they would be sunk would have to be removed to build the foundation of the lighthouse. Then he proposes to have the tubes sufficiently high to prevent the water entering the cavity at high tide; but I beg to submit, that few persons know what high tide means during a storm, particularly if the spray is to be taken into account—so that, in all probability, the cavity would be filled with water at every tide. If it is essential to build a foundation on the chalk below the sand, I can see no difficulty in following the directions of G. Shepherd; but the cylinder might be made larger, in order to give a wider basis for the lighthouse itself to be built on, and the expense of his plan would not be very great. A plan, which I proposed some time since to several persons, but which would be by far more expensive, was to rivet a number of wrought-iron plates, half-an-inch in thickness, and 20 ft. in height, in the form of a cylinder, or rather ring, not less than 200 ft. in diameter. This ring would be placed on the sand; and, the edges being sharp, would be sunk below by means of several steam-hammers. When sunk nearly level with the sand, I would place an immense platform of iron over it, covering the whole area enclosed by the ring. This platform would be made of sheet-iron of the same thickness and strengthened with iron ribs, and would be fastened to the projecting flange of the ring by means of bolts. I would then construct the lighthouse on the centre of the platform with sheet-iron—a framework for supporting the structure being first fastened on the platform. The lighthouse would be also built inside with stones, in order to render it as strong as the Eddystone, leaving, of course, sufficient space inside for the stairs. There would be thus an immense weight on the platform, which would be supported on the sand; but the sand enclosed in the ring could never be disturbed by the water—so that the structure could not sink below the level of the surrounding sand; but to give an additional strength to the structure, I would cover the whole platform with stones and concrete to the height of at least 20 ft.; and then I would cover the whole with sheet-iron rivetted together, and forming a gradient, or rather a curve, from the edge of the platform to the lighthouse—so that the whole would be as one building.

I presume, that its immense weight would prevent its shifting; while the ring would prevent any injurious effect by the shifting of the sand on one side; I believe the sands are not liable to shift to a very great depth. A few years since, I met an old sailor, who had been saved some time before, from the wreck of a collier, cast on the Godwin Sands. He told me, that as the tide rose, the waves rolled *in* the sand, forming a mixture, which appeared to be of the consistence of porridge; but, to his surprise, he found, when the tide receded, that the sand was so hard, that on treading violently on it, it scarcely left any impression; and I may remark, that the tubes of the lighthouse, which has been lately destroyed on that spot, have been broken above the level of the sand, so that it was not through the shifting of the sands that it gave way—for, had the sands shifted to a great depth, the tubes would have been broken considerably below, leaving no trace of the building. In my opinion, this structure was too heavy at the top, and the tubes, being 18 in. in diameter, offered a considerable surface to the waves. Had iron bars, 3 in. in diameter, and tapering at the top, been used, and the lighthouse itself been constructed in the form of a globe, there would have been much less surface exposed to the waves. I, however, consider it very probable, that it has been demolished by some pieces of timber having been driven against it by the waves; a mast of a vessel, coming in contact with it, would act, during a storm, as a battering ram, which would soon demolish the whole structure.

*Liverpool*, 12 *mo.* 21. JOHN DE LA HAYE.

[We publish the letter of Mr. De la Haye, without entirely agreeing in his sentiments; we think a series of hollow piles would not be more expensive than a cylinder of sheet-iron of the necessary thickness, to say nothing of the greater facility of sinking, and their superior strength when securely fastened together, and filled with solid masonry set in concrete. We cannot suppose "Terro-Nauticus" intended to recommend his lower works open for the admission of the waves, but the whole to be carried up solid to the entrance to the internal staircase, as far from the reach of the waves in a storm, as might be deemed necessary. At the Eddystone it is common for the sea to wash completely over the pinnacle above the lantern. The firmness of these sands at low water is well known—in fine weather many a game at cricket has been played on them.]

### PHILOSOPHY OF LIGHT.

RESPECTED FRIEND,—In my former papers, published in thy columns, in alluding to the cause of light and heat, I stated that, in my opinion, both were caused by the attraction of the sun acting on our atmosphere. With thy permission, I will carry the inquiry farther, regarding the range to which light extends. It is well known, that our atmosphere does not extend so high as 50 miles above the earth—while it has been conjectured that a subtle fluid, or *medium of space*, exists between the earth, sun, and fixed stars; but here the question may suggest itself—would the sun be visible, were it possible to reach the boundary of our atmosphere? I should suppose that we could see neither sun nor stars, or, in other words, that our atmosphere is the medium through which those bodies are reflected. The conclusion to which I have arrived is, that all immensity, or the space in which the planetary bodies roll, *is totally devoid of light*, the atmosphere only of the sun and planets being illuminated—so that the surface of our atmosphere would be an immense arch of darkness. The thought is, perhaps, "awfully sublime"—yet, if the subject is closely investigated, it will, I believe, be seen, that there can be no light between our atmosphere and the sun; but it may be said, that when we see the sun, there is no appearance of the space between being dark. Very true, but the rays of light which seem to reach us from the sun, are, I presume, an illusion. The sun is seen through the intervening darkness, and, if all

space were illuminated, we could not see the stars in the night, or rather there would be no night at all—for, while the sun would be opposite the other part of the earth, its rays would pass within 5000 miles of our eye, on their way to the more distant planets, yet we do not see the light until it has reached those bodies. It has been said, that the stars and planets cannot be seen from the sun, as the surrounding light is too great to see anything beyond it; but, if all space is dark, the planets can be seen from the sun through the darkness—thus, if a lighted candle is placed near a large furnace, it gives no light, for its light being feeble, it is lost in the larger blaze; but, if it is carried to a distance in a dark space, the light is seen reflected, even if the eye is very near the furnace, and thus it is with the planets, they must appear as stars from the sun—while, if all space were illuminated by the sun, neither star or planet would be visible from it, as its own light would be greater than that of those bodies—so that they would be lost in its immense flood of light. But, to enter for a moment on the remote cause of light and heat, I suppose that the attraction of the sun, caused partly by its immense bulk, acts upon all matter within the range of its influence—firstly, on its own atmosphere, causing light and heat, but not, I would suppose, very near the sun—so that there may be a comparatively cold atmosphere between the luminous atmosphere of the sun and the sun itself; the attraction extending beyond this, causes the *medium of space* to be in a perpetual motion; then it extends to the planets, and on their atmosphere keeping the whole mass of matter in motion. It should be here noted, that the planets nearest the sun are the most dense, and it is probable that the same rule follows in respect to their atmospheres—so that the result of the sun's attraction in causing light and heat, may be the same in all the planets, and on the atmosphere in which the inhabitants of the sun exist. We might conclude, that while we use the terms rays or particles of light, as we might say, the electric fluid, in alluding to the visible effects of imponderable bodies, there is no such thing as a chain of light passing from the illuminating to the illuminated body—that is, from the sun to the planets; but, rather, that the *medium of space* is simply the conductor of the power, which causes one body to be seen from the other; the atmosphere acting on our sight in a manner analogous to the telescope. I do not know how far the theory of space containing no light is new—it was so to me, when I first conjectured it—and I have seen no allusion to this subject in any work which I have perused; yet the correctness of this philosophy of light appears so self-evident, that, possibly, something like it may have been conjectured before, if not satisfactorily proved. Still these facts—if I may be permitted to call them facts—do not seem to be generally known. JOHN DE LA HAYE.

*Liverpool, 12 mo. 21.*

## IRON IN ITS ACTIVE AND INACTIVE STATES.

SIR,—In Mr. Spencer's lecture on the above subject, published in your valuable columns of the 11th inst., he observes—"All are aware that nitric acid rapidly dissolves iron. Prepare a few slips of clean iron wire, 6 or 8 inches long, and one-eighth of an inch diameter. Of course, there is no limit to the dimensions. Let a glass be procured nearly filled with nitric acid, of the specific gravity of 1300 or 1350, and place a piece of platinum or gold coin at the bottom. If one of the slips be immersed in the acid, violent action ensues, which ceases when the wire comes in contact with the platinum or gold." He then proceeds to describe other extraordinary phenomena, connected with iron so immersed. Now, Sir, a few days ago I tried this experiment with an acid, which the chemist, of whom I purchased it, assured me was of a specific gravity above 1300, and placing a half sovereign in the glass. The experiment wholly failed, as rapid an action continuing when the wire touched the coin as before, and, on reversing the end of the wires, the same effervescence continued. Perhaps Mr. Spencer would endeavour to explain in what way I could have failed, or if there is any error or omission in his description. A. B.

*St. John's Wood, Dec. 22.*

## BRICK ARCHES AND TUNNELS.

SIR,—Some time ago, I addressed a communication on the subject of brick arches and tunnels, to Sir John Rennie, president of the Institution of Civil Engineers; but, as it has never been acknowledged, I presume it has not been received. I have no personal acquaintance with Sir John, though, in 1818, his brother, Mr. George Rennie, now governor of the Falkland Islands, and I—were often associated in experiments together in the laboratory of the Surrey Institution. I must presume, however, that my communication never reached, and that the mere lack of *personal* acquaintance with the president, would have formed no barrier to its introduction. Its substance *in brief* was as follows:—The destruction of brick arches, &c., might be ascribed to a two-fold cause: first, the absorption of moisture by the brick, and its bursting by reason of the *expansion* produced in the act of freezing in frosty weather—the chief cause of the ruin of mountains, as in "Uris rocky world." The second cause, not so obvious, is the *calcination* of accidental fragments of carbonate of lime, in burning the brick; the access of water would, in this case, necessarily cause the brick to fly in pieces. To one or other of these causes may be ascribed the destruction and fall of brick tunnels, as those on the continent, &c. The remedy is sufficiently simple—all access of water should be cut off, by the brickwork being insulated, &c., by means of *asphalte*. Are all our railway tunnels perfectly secure? I shall not presume to answer the question.—J. MURRAY: *Portland-place, Hull, Dec. 16.*

## THE GUN-COTTON EXPLOSION.

SIR,—It seems to me altogether unaccountable that the simple question, as to the *quantity* of gun-cotton on the premises of Messrs. Hall, at the time the explosion occurred, should never have been mooted. I picked up a small portion of gun-cotton from among the rubbish of the ruins just *three months* from the date of that event, which, you are aware, occurred on the 14th July last; and I find, that though so long exposed to the vicissitudes of dry and wet weather, and alternations of temperature, its qualities remain entirely unimpaired. The *cause* of the explosion seems to be veiled in impenetrable obscurity, according to the evidence adduced on the coroner's inquest; the temperature in the one drying-room did not exceed 110°! and that in the other 120°! and a self-registering thermometer afforded a check. I cannot think the *temperature* of the *external* atmosphere was concerned in the *primary* act of explosion, and its *electric* condition will scarcely account for it. I am inclined to ascribe it either to *spontaneous* combustion suddenly developed, or the compression of the gun-cotton into the cartridges. The *secondary* explosion, I am inclined entirely to attribute to the *compression* of the air produced by the previous explosion, and the electricity and temperature thence arising. I sincerely hope and trust Messrs. Hall will meddle no more with the manufacture of so intractable a material, which would assuredly afford a most just case of interference on the part of Government. J. MURRAY

*Portland-place, Hull, Dec. 16.*

## PROGRESS OF LITHOGRAPHY—SOCIETY OF ARTS.

SIR,—I attended the seventh meeting of the Society of Arts, yesterday evening, with great interest; and, as a member of the society, felt no small degree of pride—not only at the subject of the evening being so well chosen, but at witnessing the great attention of a numerous and most respectable audience, and beholding the numerous assemblage of beautiful specimens of the art of lithography, which adorned the walls. I consider, that the encouragement of lithography is of great national importance, and particularly to the rising generation of artists. The lecturer Mr. Smith Williams, was concise and clear; and, as far as he could, at a lecture, unassisted by any practical application of the art, performed its duty well, to a highly-gratified audience. But there seemed to be rather a leaning of favour to Mr. Hullmandel's practice and inventions, and particularly to the last invention of Mr. Hullmandel—the practice *by the stump*. Now, I feel assured, that if this practice prevails, the art of lithography will go backwards—instead of rivalling the French, we shall fall far behind them. I appeal to the most experienced and practical lithographers, would they, in any work of art on which they wished to establish their fame and character, venture to stump in any part of a well-paid work of art, which they were instructed to execute? I think not. "There is no royal road to geometry," neither is there to any of the higher branches of the fine arts. It is well for Harding, Stanfield, Landseer, and other talented artists, to make a stump sketch for an effect, which they wish speedily to produce, just as a painter practised in oil colours, produces a hasty sketch for effect, in any design he may have in his mind.

Even Mr. Smith Williams earnestly, and very properly, insisted on the skill, patience, perseverance, and care required in all the processes of lithography; he insisted particularly on the cause of the superiority of the French lithographers, in consequence of their skilful art in *crayon drawing, combined with their knowledge of form*; and, therefore, I felt much surprised that this new invention of Mr. Hullmandel should have been held forth by the speaker as one of *the greatest improvements!* What has produced our unrivalled school of copper-plate line engraving?—not the discovery of any hasty process for executing the work, but patient labour and care in the artist, as well as excellence in the tools and materials. It must be the same with lithographists—much practice of the hand in the use of the crayon, patient and careful labour in the design, and *particularly in the shadows*—or depend upon it the British School of Lithography will not rise to any greater eminence than it has. Great I allow it to be; but still inferior to the French. I have thus humbly expressed my opinion as a member of the society, ardently loving the fine arts myself, and feeling that they are highly worthy the greatest national encouragement in all civilised nations. A MEMBER OF THE SOCIETY OF ARTS.

*Fleet-street, Dec. 23.*

## VENTILATION OF COLLIERIES.

SIR,—I cannot refuse myself the pleasure of a few remarks upon the letter of "N. B.," in your last week's Journal, on contra-distinction to the logic of some of those learned philosophers, who attempt to persuade us that the piping system is the only panacea to the dangers of mining. Your correspondents, Mr. Swedlove and Dr. Jamieson, have each been tested as to their pipe doctrines—one as to the practicability of the scheme, and the other as to the originality; and I humbly submit that neither of these learned gentlemen have rescued themselves from the obloquy which were brought against their published statements. I am, therefore, more than glad that "N. B." has approached the subject with such urbane and unequivocal reasoning—he presents a sketch of the work[illegible]s; and then asks, in the most gentle but sensible language—"Whether the regular coursing of the atmospheric air can be carried on whilst the [illegible]es for withdrawing the inflammable gas are in operation." He says—to me it appears that the inflammable gas cannot be withdrawn that without injuring the airing of the pit altogether." "If the pipes," says he, "are led to the face of the work, you cannot prevent the air in going [illegible]nd the face from entering the first pipe, in connection with the pu[illegible] any more than under the present system you can prevent the air fro[illegible]king the nearest course to the air furnace." If comparisons were not [illegible]ous, I would place this simple relation of practical fact in juxta-posi[illegible] with the learned effusions of the philosophers, and advise them to draw [illegible]erefrom a moral.

The fact so modestly referred to by "N. B." is perfectly familiar to every person at all practically acquainted with the disposition of a coal mine. For what purpose are trap-doors applied, but to turn the air-current away from the upcast shaft into distant workings—and does not the leakage at every trap-door show that the air will escape at every near-hand opening, rather than go the circuit of the mine? Then, how can any reflecting philosophers will, as "N. B." person avoid seeing, that the pipes of [illegible] air of the mine, and, therefore, questions, be filled with the atmosphe[illegible] in that which may be insensibly can have no room for any other gas [illegible] As for "*the conversion of the passages of the mine into a series of inclin[illegible] planes, for the gas to escape by,*" mixed up with the circulating current[illegible] the idea is too absurd to deserve a se[illegible]ous refutation. The main workings of a colliery are naturally supposed [illegible]ie to the rise of the shaft—which rise may amount to many fathoms; [illegible]how, then, can any such doctrine as that referred to be adopted?

It is all very fine to exhibit a few philosophical experiments, with well-drawn sections, and accompanied with learned theories of gravity and of density; but, again for the third time, I speat, such theorists should visit mines, and become acquainted with the practice, as well as the desiderata wanted, for then only can they escape the criticism of those who understand the subject practically.—*Newcastle, Dec. 22.*

## VENTILATION OF MINES.

SIR,—Your correspondent Mr. Cadman, of the Tondu Iron-Works, is quite right in stating that Mr. Struvé's machine, or air-pump, has been long in use—I myself having [illegible]e so 27 years ago, for the purpose of *drawing air out* of a drift, in opening a new coal-field in the West Riding of Yorkshire, and have since used it when needful; my first use of it was from having seen a publishe[illegible] account of it—the invention of a Mr. J. Taylor, in Cornwall.—H. HAYTOR: *Barnborough-hall, Doncaster, Dec. 23.*

## MR. STRUVÉ'S MINE VENTILATOR

SIR,—I am inclined to think that Mr. Struvé has not taken into account the amount of power, and strength of parts, of his mine-exhausting gasometer machine; he must recollect, that he shuts up every other means of ventilation in a mine, and I should like to have his carefully collected ideas on the subject of the very old extensive mines now at work, where the air and horse-ways are passing through, and by the side of, perhaps, 100 acres of goaf; I think he will find a much larger power and strength of parts necessary. The present mode of ventilation is Nature's own law, aided by what assistance can afford. Mr. Struvé does not allow Nature to act at all; and yet should like to see it tried on a moderate size colliery, but by no means to have a working pit for his upcast; for, though his method of covering it is ingenious enough, he cannot do it perfectly, for every time the carriage goes to the top of the pit, there will be a rush of cold air from the surface into the gasometer; and to talk of one pit partitioned into two sides, is, under any circumstances, wretchedly unworkmanlike, and has been the cause of immense loss of life. Let him select for his machine an upcast pit, quite independent of a working pit, and water power, if near, would be the best for the apparatus. I wish him success; for with all the talking on the subject, we are only following in the steps of our forefathers, 1000 years since, with this difference, that their min[illegible] were neither deep, nor extensive, nor had they the m[illegible] the ability to do what is being done in our day. T. [illegible]

*Blaenpon, December 23.*

[Mr. Deakin should remember that coal was not known as fuel 100 years ago; was not even worked to any extent 350 years since; and, in the reign of Elizabeth, an Act was passed, *prohibiting the use of sea coal in London.*]

## EXPLOSIONS OF STEAM-BOILERS.

SIR,—"An Engineer," to whom my letter in your Journal seems unpalatable, advances, as an opinion, that the ⅜ plate was amply sufficient, taking as data such plate having withstood for 14 months the pressure put upon it. I never stated that a ⅜ plate could not stand a maximum strain of 60 or 80 lbs. to the inch—my objection was to the peculiar arrangement adopted: the employment of a ⅜ tube-plate, 2 ft. 4 in. in depth, the diameter of 5 ft. 5 in. being made up by plates only half that thickness. Such plates being inefficiently stayed, it would suggest itself to the mind of "An Engineer," that the strain on the front stay, if thrown entirely on that single, would be excessive—that it was so, is evidenced by the bulging on the front plate of the unexploded boiler having amounted to nearly 2¼ in., whilst at the part to which the stay was affixed there was a decrease of ⅛ of an inch of that amount. The natural tendency of the plates would be, when pressure was on them, to assume a convex form, such convexity being greatest at the weakest portion—the plates becoming convex, an enormous strain would be thrown on the stays. If we take the mean tensile strength of iron, as proved by the experiments of Messrs. Telford, Rennie, and Barlow, at 55,872 lbs., or nearly 25 tons, to the square inch, we should have the following results:—The circular-pin, being 1 in. in diameter, would give a *maximum* tensile strength of about 19½ tons. The other stays at the back, admitting they had been in their places, and had been properly secured, would have given the following results:—Four ⅞ pins would present a sectional area, as follows: $\cdot 4417 \times 4 = 1 \cdot 7668$, or rather over 1¾ square inches, the *maximum tensile strength* of which would be 43·75 tons; and this, added to the foregoing 19½, would give 65 tons. But I imagine my opponent, "An Engineer," will not venture to assert, that this is the strength that might with safety be put upon such stays. I think I may state, that the most venturesome of the class to which my opponent evidently belongs would not subject such stays to above one-third of *their maximum tensile strength*, which would be somewhat over 21 tons. Engineers of eminence do not subject any stays to near one-third of their maximum strength; and, in an invaluable little work, lately published—I allude to Bourne's *Catechism of the Steam-Engine*, which would do eminent service to "An Engineer"—it has been stated that "iron will only bear one-third of the strain without permanent derangement of structure; and it does not appear expedient in any boiler to let the strain exceed 4000 lbs. upon the square inch of sectional area of metal; and 3000 lbs. on the square inch of section is a preferable proportion." The aggregate sectional area of metal in the stays of the exploded boiler, when perfect, only amounted to 2·2085, or under 2¼ square inches; yet we are to be told that "the staying of the boiler was perfect."

Now, Mr. Editor, I hold it to be one great point in all controversial discussions, that those engaged therein produce facts which ultimately lead—such facts being duly disseminated—to an extension of knowledge. One great inducement ought to pervade the minds of all who write: a desire to impart, as well as to receive, instruction. I am convinced there is more practical information imparted from investigating accidents than is derivable from any other source; and, where scurrility is excluded, and *facts alone* dealt with, all must, in my humble opinion, at the close of a discussion, be wiser than at its commencement. No one has deprecated more than myself the mere writing for writing's sake—*cacoethes scribendi* which exists to a great extent at the present time, of which your Journal bears ample proof. The merits of the spray pump, for instance, is an example—here has been a discussion extending over a considerable period. Nothing is easier of demonstration for Mr. Adcock—an inventor who has the capability (and those who have not, ought not to dabble in mechanics)—than showing the real power employed, and the actual results obtained. This is only done by dealing with facts—those little stubborn things which no elegance of diction can alter; if true, they are the beacons which lead inventors to ultimate success—if false, their falsity cannot be too soon rendered apparent, thereby saving many hours of unprofitable midnight toil to the poor inventor, and countless thousands to the pockets of speculative capitalists. In carrying on this discussion, I shall have ample room for the production of facts, which may benefit "An Engineer." It has been the general custom in boiler-making, where high pressures have been employed, to place stays of a comparatively small sectional area, but very close together; and in some of the fire-boxes of the locomotives lately constructed on the Great Western line, the portion of the boiler where *flat plates* are employed, there will be found ⅞ copper stays, placed only 4 in. apart throughout the entire surface; and in the domes of these boilers are 8 stays of 1⅛ inch diameter—the average number of stays in locomotive boilers used in this line being about *three hundred and sixty*, and their aggregate sectional area, amounting to over 216 square inches. The contracted for maximum strength of the *Cricket's* boilers was, I admit, only about half the pressure to which those boilers are subjected; but there is a wide difference in 216 square inches of sectional area of stays, and 2¼, the *Cricket's* allotment. With regard to the action of the larboard weighted valve, it was a point with which the Government engineers, Messrs. Lloyd and Hughes, were not acquainted—they had to arrive at their conclusions from appearances that presented themselves *ten* days after the explosion. After persons had been on board, and things removed which it was not convenient to produce, no sane man would have given credence to the existence of such a mechanical absurdity; and a gentleman accustomed to view only the superior arrangements and workmanship introduced in the steam-vessels of the Royal Navy, would be the last to imagine such a glaring inconsistency could possibly exist as the one instanced by me, which I challenge "An Engineer" to disprove.

The corrosion handed me by Mr. Meecham I did not deem worthy of notice, for the following reason:—It never had been taken, as asserted, from the *Cricket's* tubes. The form of tube was retained by the corrosion, and proves that it has been obtained from one much greater in circumference than the *Cricket's*; but, admitting such to be the fact, it would only show that the generating capabilities of the boiler had been injured to a great extent—which would be the very reverse of the point endeavoured to be established. I have seen similar corrosion take place on the inside of tubes where patent fuel has been employed; and I imagine this corrosion was obtained from a leaky tube, and one where Welsh coal was not employed.

My objection to the flat valve was, such valve being located in a box not sufficiently large, the steam issuing from such valve would strike immediately against the sides of the valve-box, and on a principle known to mechanics—consequently, I should imagine, known to "An Engineer." The angle of incidence being equal to the angle of reflection, the steam would be thrown back, and a species of regurgitation generated which would render the area of the annular ring around the valve—only four-fifths its proper size in the first case—still more inefficient.

My other "erroneous" ideas, combined with the theory of the action of the gauge, "not dreamt of in my philosophy," as this letter has extended already to too great a length, I must reserve for your next week's Journal.

*Park Terrace, Battersea, Dec. 23.* E. WHITLEY BAKER.

## HIGHTON'S ELECTRIC TELEGRAPH.

SIR,—In your last Number, I observe a letter, by a Mr. Chapman, of Leicester, copied from the *Builder*, in which he says—"The one-wired telegraph used at Baden-Baden, appears to be that of Brett and Little."

I do not know from what source Mr. Chapman derives his information; but, whatever it be, he has been deceived as to the point. Your statement, some weeks since, that the Baden Government had adopted Highton's gold leaf telegraph was quite correct; and I am sure you will agree with me, that, before Mr. Chapman contradicted it, he ought to have taken more pains to ascertain the correctness of this information.

*Euston-station, Dec. 21.* EDWARD HIGHTON.

## ADCOCK'S SPRAY PUMP.

SIR,—Your correspondent, "C. E.," in his communications of the 13th Nov., and 18th December, displays infinitely more zeal than discretion: he writes without argument, and declaims without making one reasonable remark. His letters, throughout, display a strange absence of grammar, sound logic, and even an elementary knowledge of science; and, while he professes the most profound contempt for "book-learned" philosophers, he very unceremoniously mimics the character, by a most flagrant plagiarism; for the table which he vulgarly styles, "Of the force of winds," is from the elaborate *Statistics of Locomotion, compared with the Velocity of the Wind*, the latter calculated by Professor Ferguson, F.R.S.; in adopting which, as his own, "C. E." has incorrectly altered a few terminal figures, and given a few different, but synonymous words, in the explanations, to cover this petty larceny. It is not often that such an over-zealous, unlettered, friend as "C. E." is to be found volunteering as a champion in the cause of one who is "a perfect stranger;" but since he is so particular in assuring us of his entire ignorance of Mr. Adcock, I may be permitted to acquaint him, that that gentleman is pretty well known as the author of *Rules and Data for the Steam-Engine, both Stationary and Locomotive*; and for *Railways, Canals, and Turnpike-roads, being a Synopsis of Eight Lectures on Mechanical Philosophy, illustrative of the most recent modes of construction*; and *An Exposition of the Errors of which Patentees and others are liable, from their not being acquainted with the Practical Departments of Engineering.*

In his first letter, "C. E." denounces the criticisms of the spray pump, in your Journal, as "a disgrace to the nation and the age," but omits adducing a single proof to establish this monstrous assertion. For my own part, I consider that any impartial reader of your much esteemed paper will agree with me that, apart from some little occasional warmth of discussion, the principles and practice of the spray pump have been so ably, fairly, and fully stated, that even the patentee himself, as a scientific lecturer and writer, has, so far from disproving those statements, always shrunk from giving answers to every plain, simple, inquiry of a practical bearing. In the same letter, "C. E." elegantly and scientifically states, that "the spray pump, in its *present state of perfection*, is not well adapted for sinking operations;" and again, "it is liable to be deranged, in *blasting* the hard ground with *gunpowder*." Another of his beauties of style and sense flashes on us, where, in his last letter, he says, "I can tell Mr. Williams this, that had Mr. Adcock as many friends to support him in testing his pump, as he has *ignorant prejudices* to contend with against its merits, the spray pump would long since have been before the public." Has he actually seen no reports of the public exhibitions of the pump at Llanhiddal and other places, before mine owners, ironmasters, engineers, and gentlemen of rank and fortune interested in mining operations? Does he charge all these with possessing only "ignorant prejudices?" Such language is wild and reckless in the extreme.

Equally foolish is his declaration, that—"no sooner does an inventor make known his discovery, than he is assailed by the book-learned would-be philosophers;" and further on he says—"the merits of the spray pump have not had a fair trial!" What fustian such assertions must appear to all who know (except, perhaps, "C. E.") that the spray pump has cost capitalists many thousands of pounds during the trials made with it, for the last six years, and continues to the present day to be advertised as "perfected and successful" at Llanhiddel.—P.S.—While on the subject, I may mention, that the dates of Mr. Adcock's patents (suppressed in his pamphlet on the *Spray Pump*), are 9th December, 1836, and 23d May, 1838, so that the first expires in 1850, and the last in 1853, very little above four years hence.—M. R.

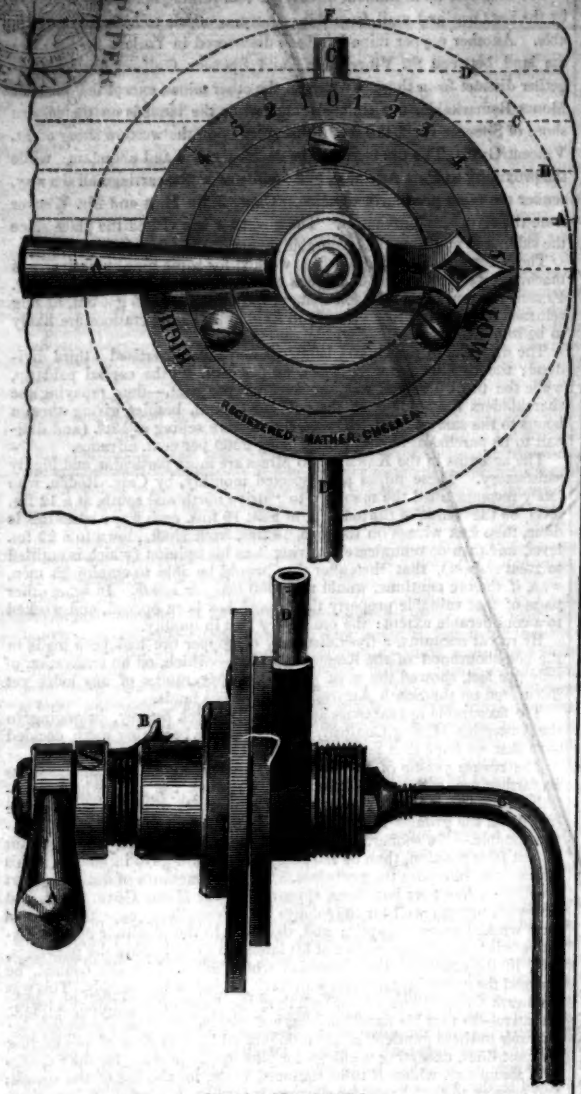
Mr. Young, a chemist, of Manchester, has discovered that a waste product from the manufacture of chlorine, consisting chiefly of a solution of chloride of manganese, destroys the odour of night soil and other decomposing matters without impairing their fertility. The liquid is produced in very large quantities, and has hitherto been thrown away.

FIRST EXPLORATION OF A CAVERN.—In the limestone strata, which composed the bases of the mountains at Ingleborough and Penaighent, in the West Riding of Yorkshire, there are a number of chasms, called pots, in the dialect of the district, most of them of an unknown depth, and generally the receptacle of some mountain stream. They are commonly so formed about their openings on the surface of the ground as to preclude the possibility of looking down them, or making a descent even with ropes or ladders. The descent into one of the largest of these gulfs has, however, lately been effected through a large, and, as far as is known, hitherto unexplored cavern, by a party of the neighbouring gentry, consisting of Messrs. J. Birkbeck, W. Howson, and W. and T. Carr. The entrance into the cave is situated about 200 yards above Alum Pot, as the chasm is called, towards which it proceeds in a tortuous course, by gradual and occasional abrupt descents, through vast chambers, till it terminates at the edge of the precipice, from which may be descried, far above, the mouth of the pot, and 50 ft. below the apparent bottom. This precipice has been descended with tolerable ease by means of ladders taken through the cave, and with ropes. On proceeding forward, under wide arches of overhanging rocks, and a farther descent of 40 ft., the lowest accessible bottom is reached, and the river presents itself to the eye of the spectator. The height of the waterfall thus seen is 120 ft., and it falls on, in the same perpendicular torrent, down another chasm, a depth of 150 ft.

THAMES TUNNEL COMPANY.

The number of passengers who passed through the Tunnel in the week ending Dec. 18, was 16,998; amount of money, £70 16s. 6d.

### J. MATHER'S IMPROVED REVOLVING WATER INDICATOR.




[Registered Dec. 1, 1847.]

The advantages of which, over the common gauge cocks, are—1. Its simplicity of construction.—2. Less liable to corrosion, or derangement, in any of its parts—also, less expensive, and more easily applied.—3. Being able to tell the exact quantity of water in the boiler, as shown by the dotted lines on *fig.* 1, by the handle, A; move the pointer, B, to O, the tube, C, will be on the water line at 5; and, if the water be at that point, it will be shown, by coming through the tube, D; or, if steam be there, it will be shown in like manner. So on will be shown, or indicated, the rise and fall of the water in inches, by moving the pointer to 1, 2, 3, 4, 5; the tube, C, will be at the points, A, B, C, D, E; and, as before stated, indicate whether water, or steam, be at those points. After the quantity of water is ascertained, place the handle, A, horizontally, and the communication is shut off, until again required—whereas, with the common gauge cocks, which are generally placed 3 in. apart, it cannot be ascertained, whether the water has just left the upper cock, or is close upon the lower one—consequently, the exact quantity cannot be ascertained, excepting when at the cocks. The inventor of the above water-gauge does not presume entirely to dispense with the glass gauge cocks now in use, particularly when they can be applied with advantage and safety, which is not generally the case—for it is well known, that accidents are frequently happening, in consequence of the glass tube breaking, from a variety of causes, which renders them, in a degree, dangerous to those engaged near them; in all cases, other gauges are fixed to the boiler—such as the three cocks, and other contrivances; amongst them is the common float, which is pretty generally used. This is a clumsy and expensive machine, having a constant leaking, and a tendency to stick in the stuffing-box, which the wires pass through. The three cocks are subject to these faults—not only from leakage, but from the number of holes made in the boiler, and the impossibility of knowing the exact situation of the water between them. The improved revolving gauge obviates all these defects—it requires but one hole, and can be attached to any shape of boiler. It affords every facility for getting to its working parts, or facing, which can be cleaned and re-ground, if required, without either running the water out of the boiler, or moving the man hole. The extreme simplicity of this gauge brings it within the reach of all persons having boilers, as regards cheapness; and, at the same time, is ornamental, and gives a finish to the boiler.

### INTERESTING STATISTICS OF THE UNITED STATES.

| | | |
|---|---|---|
| Specie in the country on the 30th Sept., 1820, was | $ 20,000,000 | |
| Ditto imported since then, to 30th June, 1846 | 221,684,605 | |
| Deduct export to same date | | 162,425,779 |
| Leaving on hand, 30th June, 1846 | $ 79,258,826 | |
| Estimated net addition, from 30th June, 1846, to 1st November | 20,000,000 | |
| | $ 99,258,826 | |

Or say, in round numbers, $100,000,000.—In this calculation, the production from the mines in the country, and also what is imported by emigrants, is set off against the amount lost—manufactured into plate, jewelry, &c.; but this, it is said, is probably too liberal an allowance—that is, the amount added from the two sources mentioned, is probably greater than the amount subtracted by consumption and loss. Consumption of cotton by manufacturers, in the United States, is 800,000 bales, of 450 lbs. each: sugar, 250,000 hhds., or 130,000 tons—averaging about 2 tons per acre. In corn, 600,000,000 of bushels, or 75,000,000 quarters—valued at 73 to 76 cents per bushel—is 112,500,000/.: 60,000 tons railroad iron was manufactured in 1846.

ARTIFICIAL QUARTZ.—At a meeting of the Paris Academy of Sciences, on the 6th inst., M. Ebelmen submitted some beautiful specimens of artificial quartz. It is known that pure silicic acid constitutes one of the minerals the most remarkable for its transparency—viz., quartz—but, in general, a large proportion of foreign matters gives a colour to this substance, and renders it opaque. Chemists have long known how to clear the silicic acid of the impurities by which it is deteriorated; but they have only been able to obtain an opaque jelly, which does not at all resemble the natural and diaphanous production. M. Ebelmen was the first to obtain, by artificial means, a perfectly-transparent substance. He does this by exposing to the action of a moist atmosphere the combination of silicic acid and ether, called silicic ether, and which substance was also discovered by M. Ebelmen. This mass contracts and hardens gradually. At the end of two or three months, it is transformed into a substance sufficiently hard to cut glass, as transparent as glass, but not crystallised. It is now about two years since M. Ebelmen made these facts public; since that time, he has been able, by repeated experiments, to render his products more perfect, and again presented to the Academy specimens of much larger dimensions. Amongst them are some to which he has given various tints, by mixing colouring substances with the silicic ether. The specimens, impregnated with chloride of gold, are very beautiful. At the end of a certain time, the chloride is decomposed, and streaks of gold appear in the entire mass. The decomposition is accelerated by the action of the solar light; and, under its influence, also bright colours are obtained—sometimes blue, sometimes red, and at other times violet. By a modification of this process, M. Ebelmen obtains a true natural mineral—the *hydro-phane*. It is a siliceous, porous, and opaque substance, which becomes perfectly diaphanous as soon as it is plunged into water. M. Ebelmen has ascertained that this substance absorbs gases as powerfully as does charcoal.

## Original Correspondence.

### CENTRAL HEAT.

SIR,—The arguments adduced by Mr. Lyell, in attempting to controvert the doctrine of central heat, are of the most fallacious nature. What analogy can subsist between a crucible, however large, *surrounded* by ignited matter, and inclosing a homogeneous mass in a state of fusion, and the earth, moving in space, and subject internally to the laws of gravitation, and to electro-magnetic influences, about which very little is known, and still less understood; whilst, in this latter instance, a cold and hardened crust of matter, infinitely varied in its component structure and material, encloses a nucleus of intensely-heated matter. Admitting for a moment, that the deduction, from Mr. Daniel's experiments, is valid when applied, as Mr. Lyell says, to quantities of matter, however great, when entering into fusion—then, since the ocean is a vast quantity of fused ice, and since vast quantities of ice are at this moment dissolving, or undergoing fusion therein, and have been thus dissolving for ages, it follows that the temperature of the ocean cannot be raised one degree above the melting point of ice—that is to say, it cannot be higher than 33°. But this is a palpable absurdity; and, *a fortiori*, the theorising of Mr. Lyell, built upon this frail foundation, is palpably absurd. Hear, now, the *Westminster Review*, in its *able support* of this false reasoning, drawn from the crucible. Within the tropics, says this authority, the temperature of the ocean diminishes, from the surface downwards, at the mean rate of 1° in 25 fms. Taking this as an axiom, and supposing the temperature of the sea in the tropics to be 80° at the surface—a very liberal estimate—it follows, that the temperature, at a depth of 1200 fms., will be 32°—*i. e.*, at the freezing point; and at 2000 fms. the temperature must be at zero. Hence, all the water at a greater depth than 1200 fms., must exist in the state of solid ice; but, by Mr. Lyell's principle, the water in which this ice is undergoing fusion *must be* at the melting point of ice, within 1°—that is, at less than 33°—an absurdity which needs no refutation. Such are the contradictory puerilities advanced by the philosophers of the age, to controvert the opinions of the great Leibnitz, who was second only to Sir Isaac Newton, in power of intellect, and in the justness and accuracy of his conclusions. Mr. Lyell goes on to suppose, that the globe should be composed of water and ice only, and then proceeds to reason against central heat, upon the deductions drawn from this hypothesis; but here, again, there is no analogy, for the specific gravity of the planet would, in that case, be less than 1·000; whilst, as the planet really exists, its specific gravity is more than 4·000. A misapprehension of the nature of imponderables seems to constitute the *lapis offensionis* of the opponents of central heat. Heat and other imponderables are, I consider, fluids or gases, which are not subject to the influence of gravitation; and they may, therefore, be added or substracted in large quantities from gravitating matter, without any increase or diminution taking place in the weight of a given magnitude of that matter. Imponderables are matter, but they are obedient only to the laws of electricity, and not to those of gravitation; when the former laws are as well known as those of gravitation, it may cease to appear surprising, that a nucleus of heated matter should occupy the central regions of the earth for ages, without loss from radiation, or increase from electro-chemical action.

The magnetic power will raise iron, but it will not lift lead—hence, in a state of existence, when magnetic power supplied the place of gravity, lead would be an imponderable, and, at an intense temperature, it would probably exist as a subtile and invisible gas. If the imponderables—heat and light—were obedient to the force of gravity, they would, from their extreme subtility, be instantaneously drawn by that force into the body of the earth, and neither of them could then produce their present beneficial effects; or, if subject to the same laws as the lighter gases—such as hydrogen—they would rise to the surface of the atmosphere, or, at least, to that height, when the rarity of the latter indicated a medium not denser than the ascending gas. I should much like to see a rational explanation of the phenomena of volcanoes and earthquakes, rendered by an opponent of the doctrine of central heat. Volcanoes and earthquakes are so intimately connected, that an explanation of either ought to elucidate both. The electrical theory of earthquakes does not explain the phenomenon of volcanic action.—ROBERT MUSHET: *Coleford, Dec.* 21.

### PROPOSED CAST-IRON CELLULAR FOUNDATION FOR A LIGHT-HOUSE ON THE GODWIN SANDS.

SIR,—For many years past, there have been various attempts to erect a permanent beacon on the Godwin Sands, all of which have invariably failed. The requirements, however, of the great commercial interests of the kingdom, forbid the subject being given up in despair; and, in consequence, the attention of engineers, and other scientific persons, has been constantly employed in endeavouring to solve the difficulties of the problem connected with so great a desideratum. If the following remarks, or suggestions, should, in your judgment, be at all likely to prove *useful*, or tend to the ultimate production of *practical* results, it will be a great satisfaction to me, if you will insert them in your widely-influential Journal. In the structures hitherto attempted, it seems to have been a principle, that a sufficiently secure foundation might be obtained, by merely sinking a certain depth in the sand *alone*; facts, however, have shown this principle to be incorrect. The next step has been a proposition to excavate an area, of sufficient extent for a structure 90 ft. in height, to the depth of the solid rock, and fill in the excavation with concrete. This, however, apart from the great practical difficulties necessarily attending its construction, and only to be surmounted at great cost, is also open to further objections of an after consideration. It is well known that, in heavy storms, these sands are one mass of agitation, often, also, being wholly shifted considerable distances; at these times, therefore, when most requisite, the concrete foundation could receive no other *lateral* support, to resist the united shock and vibration, occasioned by the beating of the sand and waves against the heavy and lofty structure resting upon it, than a thin wrought-iron boiler plate casing. It is hardly possible to suppose, therefore, that a body of concrete, so supported, merely could alone resist the union of all these forces—especially, when it is remembered, that its thorough homogeneousness is, at the best of times, always a matter of uncertainty, and much more so in the situation under consideration—at any *rate*, there are *chances* connected with it, which it would be prudent to avoid. I think, therefore, that the foundation, which is intended to be *permanent* in this situation, must be dependent for its security neither upon the sand nor the surface *merely* of the chalk rock, but must be *firmly rooted into the rock itself*. The method to be adopted for the carrying out of this principle, would be to sink a hollow cast-iron pile (say) some 7 ft. in diameter, by Dr. Potts's pneumatic process, to the level of the top of the chalk. Additional lengths should then be affixed, to the extent of the depth proposed to be sunk into the rock; and a close cover being fitted over the top, as in the pneumatic process, by means of air-pumps, the pile should be converted into an immense diving-bell—then, by an arrangement of doors and shutters of easy detail, operations could be carried on within the interior, by which a well could be sunk immediately under the pile, and the whole gradually lowered to its required depth. If it should then be decided to have a beacon light merely, this pile, filled with concrete, to give it additional weight, would be an ample and secure foundation. If, however, a lighthouse, of an extensive range, should be thought advisable—and such the interests involved seem to demand—an enlarged foundation would become necessary. For this I would propose the following method:—On the outside of the centre pile, already described, dove-tail slides should be cast; around this there should then be sunk, by the pneumatic process, a complete casing of cast-iron piles, about 4 ft. by 5 ft. scantling, and six or eight in number, provided with grooves, so as to dove-tail into the guiding slides, furnished for that purpose. These piles should not be circular, but square—so that each should fit to the other, without allowing any vacant interstices. The radiating joints should all be flush up like those of an arch, and the sides cast to the circular sweeps, so as to make the whole one dove-tail mass. These, when filled with concrete, would be so far complete. Other rows of piles could then be proceeded with, to any extent, in the same manner, taking care only, as an additional security, that in the row intended for the outside, alternately, or at certain distances, the piles should be sunk, as described, for the centre one. By this means, a foundation would be provided, which nothing short of the entire dislocation of the chalk bed could ever remove, and similar in principle to a vast cast-iron tooth, of the strongest cellular construction, firmly flanged into the rock. This plan, though it might be attended with considerable outlay in the first instance, could be subject to no uncertainty—a point of great engineering importance—each part, as proceeded with, forming an addition thoroughly complete in itself, and dependent for support upon no *temporary* structure, until the final closing of the whole. It is not to be supposed, however, that in so great an undertaking, occasional derangement might not occur to the apparatus; but as this would be light, and involve no injury to the permanent work, it could be easily repaired. I feel, that an apology is necessary for requesting the insertion of the above in a paper, in which it may be considered by some as out of place. I know, however, of no other by which the above suggestions can be so early, or so widely, circulated amongst a thinking and intelligent class, by whom *practical* results are most rapidly produced.—M.: *Wolverhampton, Dec.* 11.

### IMPROVEMENTS IN THE CONSTRUCTION OF LIGHTHOUSES.

SIR,—Your correspondent, "Terro-Nauticus," in last week's Journal, seems to think my plan for erecting a lighthouse on the Godwin Sands an exceedingly good one, so far as it goes, and certainly has not suggested any improvement on the original principle. "Terro-Nauticus" proposes to drive a treble row of piles to form an enclosure—I presume he means a coffer-dam. Now, surely he must be a mere novice with regard to the constructions of coffer-dams, or he never would have hazarded such a suggestion. He then proposes to take out the water by means of powerful pumps. Now, Sir, it is evident that, to prevent the external water from rushing into his coffer-dam, each row of piles must be 6 ft. apart, the sand taken out from between each row to the chalk, and each space filled in with puddle, which process would be a very treacherous one, even when completed, as the smallest orifice, or vent, between the piles would bring into his supposed enclosure more sand and water than the pumps and workmen could excavate. My method is intended altogether to exclude the external sand and water from penetrating into the foundation. With respect to his remarks on the sand leaving a chasm, and pushing over my cylinder with attached piles, external piles, bracings, concrete, &c., &c., I consider that the plan proposed by "Terro-Nauticus" would be far more liable to that danger; and, as regards his commencing at eight points to drive the piles, I should commence at 16 points, if possible. In fact, Sir, I see nothing in your correspondent's letter which is not borrowed from my communication of the 27th ult., except his treble row of piles; and I certainly consider that "Tyro-Nauticus" would have been a far more appropriate name for him to assume. In conclusion, I beg to remark, that my plans for erecting lighthouses and beacons on sands and such dangerous places, will shortly be laid before the public; and I have confidence in stating that, for strength, economy, and durability, lighthouses constructed on my principles will resist the buffetting of old Neptune in the severest and most exposed places on the coast. G. SHEPHERD, C. E.

*Fleet-street, Dec.* 22.

### LIGHTHOUSES ON THE GODWIN SANDS.

RESPECTED FRIEND,—I suppose "Terro-Nauticus" must be somewhat of a tyro in nautical affairs, or he would not have proposed such a curious amendment to the plan of G. Shepherd, C.E., for constructing a lighthouse on the Godwin Sands. The principle of his plan is certainly the same; but why a cylinder, composed of iron tubes, should be stronger than if made on shore with iron plates, is incomprehensible? The tubes might protect the cylinder; but this would be at an immense expense—while, if the cylinder was composed entirely of iron tubes, "Terro-Nauticus" would find, on excavating the sand from the enclosed space, that they would be driven in the cavity as rapidly as air will rush in a vacuum, as the sand in which they would be sunk would have to be removed to build the foundation of the lighthouse. Then he proposes to have the tubes sufficiently high to prevent the water entering the cavity at high tide; but I beg to submit, that few persons know what high tide means during a storm, particularly if the spray is to be taken into account—so that, in all probability, the cavity would be filled with water at every tide. If it is essential to build a foundation on the chalk below the sand, I can see no difficulty in following the directions of G. Shepherd; but the cylinder might be made larger, in order to give a wider basis for the lighthouse itself to be built on, and the expense of his plan would not be very great. A plan, which I proposed some time since to several persons, but which would be by far more expensive, was to rivet a number of wrought-iron plates, half-an-inch in thickness, and 20 ft. in height, in the form of a cylinder, or rather ring, not less than 200 ft. in diameter. This ring would be placed on the sand; and, the edges being sharp, would be sunk below by means of several steam-hammers. When sunk nearly level with the sand, I would place an immense platform of iron over it, covering the whole area enclosed by the ring. This platform would be made of sheet-iron of the same thickness and strengthened with iron ribs, and would be fastened to the projecting flange of the ring by means of bolts. I would then construct the lighthouse on the centre of the platform with sheet-iron—a frame-work for supporting the structure being first fastened on the platform. The lighthouse would be also built inside with stones, in order to render it as strong as the Eddystone, leaving, of course, sufficient space inside for the stairs. There would be thus an immense weight on the platform, which would be supported on the sand; but the sand enclosed in the ring could never be disturbed by the water—so that the structure could not sink below the level of the surrounding sand; but to give an additional strength to the structure, I would cover the whole platform with stones and concrete to the height of at least 20 ft.; and then I would cover the whole with sheet-iron rivetted together, and forming a gradient, or rather a curve, from the edge of the platform to the lighthouse—so that the whole would be as one building.

I presume, that its immense weight would prevent its shifting; while the ring would prevent any injurious effect by the shifting of the sand on one side; I believe the sands are not liable to shift to a very great depth. A few years since, I met an old sailor, who had been saved some time before, from the wreck of a collier, cast on the Godwin Sands. He told me, that as the tide rose, the waves rolled in the sand, forming a mixture, which appeared to be of the consistence of porridge; but, to his surprise, he found, when the tide receded, that the sand was so hard, that on treading violently on it, it scarcely left any impression; and I may remark, that the tubes of the lighthouse, which has been lately destroyed on that spot, have been broken above the level of the sand, so that it was not through the shifting of the sands that it gave way—for, had the sands shifted to a great depth, the tubes would have been broken considerably below, leaving no trace of the building. In my opinion, this structure was too heavy at the top, and the tubes, being 18 in. in diameter, offered a considerable surface to the waves. Had iron bars, 3 in. in diameter, and tapering at the top, been used, and the lighthouse itself been constructed in the form of a globe, there would have been much less surface exposed to the waves. I, however, consider it very probable, that it has been demolished by some pieces of timber having been driven against it by the waves; a mast of a vessel, coming in contact with it, would act, during a storm, as a battering ram, which would soon demolish the whole structure.

*Liverpool*, 12 *mo.* 21. JOHN DE LA HAYE.

[We publish the letter of Mr. De la Haye, without entirely agreeing in his sentiments; we think a series of hollow piles would not be more expensive than a cylinder of sheet-iron of the necessary thickness, to say nothing of the greater facility of sinking, and their superior strength when securely fastened together, and filled with solid masonry set in concrete. We cannot suppose "Terro-Nauticus" intended to recommend his lower works open for the admission of the waves, but the whole to be carried up solid to the entrance to the internal staircase, as far from the reach of the waves in a storm, as might be deemed necessary. At the Eddystone it is common for the sea to wash completely over the pinnacle above the lantern. The firmness of these sands at low water is well known—in fine weather many a game at cricket has been played on them.]

### PHILOSOPHY OF LIGHT.

RESPECTED FRIEND,—In my former papers, published in thy columns, in alluding to the cause of light and heat, I stated that, in my opinion, both were caused by the attraction of the sun acting on our atmosphere. With thy permission, I will carry the inquiry further, regarding the range to which light extends. It is well known, that our atmosphere does not extend so high as 50 miles above the earth—while it has been conjectured that a subtle fluid, or *medium of space*, exists between the earth, sun, and fixed stars; but here the question may suggest itself—would the sun be visible, were it possible to reach the boundary of our atmosphere? I should suppose that we could see neither sun nor stars, or, in other words, that our atmosphere is the medium through which those bodies are reflected. The conclusion to which I have arrived is, that all immensity, or the space in which the planetary bodies roll, *is totally devoid of light*, the atmosphere only of the sun and planets being illuminated—so that the surface of our atmosphere would be an immense arch of darkness. The thought is, perhaps, "awfully sublime"—yet, if the subject is closely investigated, it will, I believe, be seen, that there can be no light between our atmosphere and the sun; but it may be said, that when we see the sun, there is no appearance of the space between being dark. Very true, but the rays of light which seem to reach us from the sun, are, I presume, an illusion. The sun is seen through the intervening darkness, and, if all

space were illuminated, we could not see the stars in the night, or rather there would be no night at all—for, while the sun would be opposite the other part of the earth, its rays would pass within 5000 miles of our eye, on their way to the more distant planets, yet we do not see the light until it has reached those bodies. It has been said, that the stars and planets cannot be seen from the sun, as the surrounding light is too great to see anything beyond it; but, if all space is dark, the planets can be seen from the sun through the darkness—thus, if a lighted candle is placed near a large furnace, it gives no light, for its light being feeble, it is lost in the larger blaze; but, if it is carried to a distance in a dark space, the light is seen reflected, even if the eye is very near the furnace, and thus it is with the planets, they must appear as stars from the sun—while, if all space were illuminated by the sun, neither star or planet would be visible from it, as its own light would be greater than that of those bodies—so that they would be lost in its immense flood of light. But, to enter for a moment on the remote cause of light and heat, I suppose that the attraction of the sun, caused partly by its immense bulk, acts upon all matter within the range of its influence—firstly, on its own atmosphere, causing light and heat, but not, I would suppose, very near the sun—so that there may be a comparatively cold atmosphere between the luminous atmosphere of the sun and the sun itself; the attraction extending beyond this, causes the *medium of space* to be in a perpetual motion; then it extends to the planets, and on their atmosphere keeping the whole mass of matter in motion. It should be here noted, that the planets nearest the sun are the most dense, and it is probable that the same rule follows in respect to their atmospheres—so that the result of the sun's attraction in causing light and heat, may be the same in all the planets, and on the atmosphere in which the inhabitants of the sun exist. We might conclude, that while we use the terms rays or particles of light, as we might say, the electric fluid, in alluding to the visible effects of imponderable bodies, there is no such thing as a chain of light passing from the illuminating to the illuminated body—that is, from the sun to the planets; but, rather, that the *medium of space* is simply the conductor of the power, which causes one body to be seen from the other; the atmosphere acting on our sight in a manner analogous to the telescope. I do not know how far the theory of space containing no light is new—it was so to me, when I first conjectured it—and I have seen no allusion to this subject in any work which I have perused; yet the correctness of this philosophy of light appears so self-evident, that, possibly, something like it may have been conjectured before, if not satisfactorily proved. Still these facts—if I may be permitted to call them facts—do not seem to be generally known. JOHN DE LA HAYE.

*Liverpool, 12 mo, 21.*

## IRON IN ITS ACTIVE AND INACTIVE STATES.

SIR,—In Mr. Spencer's lecture on the above subject, published in your valuable columns of the 11th inst., he observes—"All are aware that nitric acid rapidly dissolves iron. Prepare a few slips of clean iron wire, 6 or 8 inches long, and one-eighth of an inch diameter. Of course, there is no limit to the dimensions. Get a glass be procured nearly filled with nitric acid, of the specific gravity of 1300 or 1350, and place a piece of platinum or gold coin at the bottom. If one of the slips be immersed in the acid, violent action ensues, which ceases when the wire comes in contact with the platinum or gold." He then proceeds to describe other extraordinary phenomena, connected with iron so immersed. Now, Sir, a few days ago I tried this experiment with an acid, which the chemist, of whom I purchased it, assured me was of a specific gravity above 1300, and placing a half sovereign in the glass. The experiment wholly failed, as rapid an action continuing when the wire touched the coin as before, and, on reversing the end of the wires, the same effervescence continued. Perhaps Mr. Spencer would endeavour to explain in what way I could have failed, or if there is any error or omission in his description. A. B.

*St. John's Wood, Dec. 22.*

## BRICK ARCHES AND TUNNELS.

SIR,—Some time ago, I addressed a communication on the subject of brick arches and tunnels, to Sir John Rennie, president of the Institution of Civil Engineers; but, as it has never been acknowledged, I presume it has not been received. I have no personal acquaintance with Sir John, though, in 1818, his brother, Mr. George Rennie, now governor of the Falkland Islands, and I—were often associated in experiments together in the laboratory of the Surrey Institution. I must presume, however, that my communication never reached, and that the mere lack of *personal* acquaintance with the president, would have formed no barrier to its introduction. Its substance *in brief* was as follows:—The destruction of brick arches, &c., might be ascribed to a two-fold cause: first, the absorption of moisture by the brick, and its bursting by reason of the *expansion* produced in the act of freezing in frosty weather—the chief cause of the ruin of mountains, as in "Uris rocky world." The second cause, not so obvious, is the *calcination* of accidental fragments of carbonate of lime, in burning the brick; the access of water would, in this case, necessarily cause the brick to fly in pieces. To one or other of these causes may be ascribed the destruction and fall of brick tunnels, as those on the continent, &c. The remedy is sufficiently simple—all access of water should be cut off, by the brickwork being insulated, &c., by means of *asphalte*. Are all our railway tunnels perfectly secure? I shall not presume to answer the question.—J. MURRAY: *Portland-place, Hull, Dec. 16.*

## THE GUN-COTTON EXPLOSION.

SIR,—It seems to me altogether unaccountable that the simple question, as to the *quantity* of gun-cotton on the premises of Messrs. Hall, at the time the explosion occurred, should never have been mooted. I picked up a small portion of gun-cotton from among the rubbish of the ruins just *three months* from the date of that event, which, you are aware, occurred on the 14th July last; and I find, that though so long exposed to the vicissitudes of dry and wet weather, and alternations of temperature, its qualities remain entirely unimpaired. The *cause* of the explosion seems to be veiled in impenetrable obscurity, according to the evidence adduced on the coroner's inquest; the temperature in the one drying-room did not exceed 110°! and that in the other 120°! and a self-registering thermometer afforded a check. I cannot think the *temperature* of the *external* atmosphere was concerned in the *primary* act of explosion, and its *electric* condition will scarcely account for it. I am inclined to ascribe it either to *spontaneous* combustion suddenly developed, or the compression of the gun-cotton into the cartridges. The *secondary* explosion, I am inclined entirely to attribute to the *compression* of the air produced by the previous explosion, and the electricity and temperature thence arising. I sincerely hope and trust Messrs. Hall will meddle no more with the manufacture of so intractable a material, which would assuredly afford a most just case of interference on the part of Government. J. MURRAY

*Portland-place, Hull, Dec. 16.*

## PROGRESS OF LITHOGRAPHY—SOCIETY OF ARTS.

SIR,—I attended the seventh meeting of the Society of Arts, yesterday evening, with great interest; and, as a member of the society, felt no small degree of pride—not only at the subject of the evening being so well chosen, but at witnessing the great attention of a numerous and most respectable audience, and beholding the numerous assemblage of beautiful specimens of the art of lithography, which adorned the walls. I consider, that the encouragement of lithography is of great national importance, and particularly to the rising generation of artists. The lecturer Mr. Smith Williams, was concise and clear; and, as far as he could, at a lecture, unassisted by any practical application of the art, performed its duty well, to a highly-gratified audience. But there seemed to be rather a leaning of favour to Mr. Hullmandel's practice and inventions, and particularly to the last invention of Mr. Hullmandel—the practice *by the stump*. Now, I feel assured, that if this practice prevails, the art of lithography will go backwards—instead of rivalling the French, we shall fall far behind them. I appeal to the most experienced and practical lithographers, would they, in any work of art on which they wished to establish their fame and character, venture to stump in any part of a well-paid work of art, which they were instructed to execute? I think not. "There is no royal road to geometry," neither is there to any of the higher branches of the fine arts. It is well for Harding, Stanfield, Landseer, and other talented artists, to make a stump sketch for an effect, which they wish speedily to produce, just as a painter practised in oil colours, produces a hasty sketch for effect, in any design he may have in his mind.

Even Mr. Smith Williams earnestly, and very properly, insisted on the skill, patience, perseverance, and care required in all the processes of lithography; he insisted particularly on the cause of the superiority of the French lithographers, in consequence of their skilful art in *crayon drawing, combined with their knowledge of form*; and, therefore, I felt much surprised that this new invention of Mr. Hullmandel should have been held forth by the speaker as one of *the greatest improvements*? What has produced our unrivalled school of copper-plate line engraving?—not the discovery of any hasty process for executing the work, but patient labour and care in the artist, as well as excellence in the tools and material. It must be the same with lithographists—much practice of the hand in the use of the crayon, patient and careful labour in the design, and *particularly in the shadows*—or depend upon it the British School of Lithography will not rise to any greater eminence than it has. Great I allow it, but still inferior to the French. I have thus humbly expressed my opinion as a member of the society, ardently loving the fine arts myself, and feeling that they are highly worthy the greatest national encouragement in all civilised nations. A MEMBER OF THE SOCIETY OF ARTS.

*Fleet-street, Dec. 23.*

## VENTILATION OF COLLIERIES.

SIR,—I cannot refuse myself the pleasure of a few remarks upon the letter of "N. B.," in your last week's Journal, on contra-distinction to the logic of some of those learned philosophers, who attempt to persuade us that the piping system is the only panacea to the dangers of mining. Your correspondents, Mr. Swedtzore and Dr. Jamieson, have each been tested as to their pipe doctrines—one as to the practicability of the scheme, and the other as to the originality; and I humbly submit that neither of these learned gentlemen have rescued themselves from the objections which were brought against their published statements. I am, therefore, more than glad that "N. B." has approached the subject with such urbane and unequivocal reasoning—he presents a sketch of the work[illegible]s; and then asks, in the most gentle but sensible language—"Whether the regular coursing of the atmospheric air can be carried on whilst the [illegible]es for withdrawing the inflammable gas are in operation." He says—to me it appears that the inflammable gas cannot be withdrawn that without injuring the airing of the pit altogether." "If the pipes," says he, "are led to the face of the work, you cannot prevent the air in going [illegible] and the face from entering the first pipe, in connection with the pa[illegible]king the nearest course to the air furnace." If comparisons were not [illegible]ous, I would place this simple relation of practical fact in juxta-position with the learned effusions of the philosophers, and advise them to draw [illegible]brefrom a moral.

The fact so modestly referred to by "N. B." is perfectly familiar to every person at all practically acquainted with the disposition of a coal mine. For what purpose are trap-doors applied, but to turn the air-current away from the upcast shaft into distant workings—and does not the leakage at every trap-door show that the air will escape at every near-hand opening, rather than go the circuit of the mine? Then, how can any reflecting philosophers will, as "N. B." person avoid seeing, that the pipes of [illegible] air of the mine, and, therefore, questions, be filled with the atmosphere can have no room for any other gas [illegible]n that which may be insensibly mixed up with the circulating current. As for "*the conversion of the passages of the mine into a series of inclined planes, for the gas to escape by*," the idea is too absurd to deserve a serious refutation. The main workings of a colliery are naturally supposed to lie to the rise of the shaft—which rise may amount to many fathoms; how, then, can any such doctrine as that referred to be adopted?

It is all very fine to exhibit a few philosophical experiments, with well-drawn sections, and accompanied with learned theories of gravity and of density; but, again for the third time, I repeat, such theorists should visit mines, and become acquainted with the practice, as well as the desiderata wanted, for then only can they escape the criticism of those who understand the subject practically.—*Newcastle, Dec. 22.*

## VENTILATION OF MINES.

SIR,—Your correspondent, Mr. Cadman, of the Tondu Iron-Works, is quite right in stating that Mr. Struvé's machine, or air-pump, has been long in use—I myself having done so 27 years ago, for the purpose of *drawing air out* of a drift, in opening a new coal-field in the West Riding of Yorkshire, and have since used it when needful; my first use of it was from having seen a publishe[illegible]account of it—the invention of a Mr. J. Taylor, in Cornwall.—H. H[illegible]OP: *Barnborough-hall, Doncaster, Dec. 23.*

## MR. STRUVÉ'S MINE VENTILATOR

SIR,—I am inclined to think that Mr. Struvé has not taken into account the amount of power, and strength of parts, of his mine-exhausting gasometer machine; he must recollect, that he shuts up every other means of ventilation in a mine, and I should like to have his carefully collected ideas on the subject of the very old extensive mines now at work, where the air and horse-ways are passing through, and by the side of, perhaps, 100 acres of goaf; I think he will find a much larger power and strength of parts necessary. The present mode of ventilation is Nature's own law, aided by what assistance an can afford. Mr. Struvé does not allow Nature to act at all; and yet should like to see it tried on a moderate size colliery, but by no means have a working pit for his upcast; for, though his method of covering it is ingenious enough, he cannot do it perfectly, for every time the cringe goes to the top of the pit, there will be a rush of cold air from the surface into the gasometer; and to talk of one pit partitioned into two sides, is, under any circumstances, wretchedly unworkmanlike, and has been the cause of immense loss of life. Let him select for his machine an upcast pit, quite independent of a working pit, and water power if near, would be the best for the apparatus. I wish him success; for with all the talking on the subject, we are only following in the steps of our forefathers. 1000 years since, with this difference, that their mines were neither deep, nor extensive, nor had they the [illegible] the abilities to do what is being done in our day. T. [illegible]

*Blaenpou, December 23.*

[Mr. Deakin should remember that coal was not known as fuel 100 years ago; was not even worked to any extent 350 years since; and, in the reign of Elizabeth, an Act was passed, *prohibiting the use of sea coal in London.*]

## EXPLOSIONS OF STEAM-BOILERS.

SIR,—"An Engineer," to whom my letter in your Journal seems unpalatable, advances, as an opinion, that the ⅜ plate was amply sufficient, taking as data such plate having withstood for 14 months the pressure put upon it. I never stated that a ⅜ plate could not stand a maximum strain of 60 or 80 lbs. to the inch—my objection was to the peculiar arrangement adopted: the employment of a ⅜ tube-plate, 2 ft. 4 in. in depth, the diameter of 5 ft. 5 in. being made up by plates only half that thickness. Such plates being inefficiently stayed, it would suggest itself to the mind of "An Engineer," that the strain on the front stay, if thrown entirely on that singly, would be excessive—that it was so, is evidenced by the bulging on the front plate of the unexploded boiler having amounted to nearly 2½ in., whilst at the part to which the stay was affixed there was a decrease of ⅛ of an inch of that amount. The natural tendency of the plates would be, when pressure was on them, to assume a convex form, such convexity being greatest at the weakest portion—the plates becoming convex, an enormous strain would be thrown on the stays. If we take the mean tensile strength of iron, as proved by the experiments of Messrs. Telford, Rennie, and Barlow, at 55,872 lbs., or nearly 25 tons, to the square inch, we should have the following results:—The circular-pin, being 1 in. in diameter, would give a *maximum* tensile strength of above 19½ tons. The other stays at the back, admitting they had been in their places, and had been properly secured, would have given the following results:—Four ½ pins would present a sectional area, as follows: $\cdot 4417 \times 4 = 1 \cdot 7668$, or rather over 1¾ square inches, the *maximum tensile strength* of which would be 43·75 tons; and this, added to the foregoing 19½, would give 65 tons. But I imagine my opponent, "An Engineer," will not venture to assert, that this is the strength that might with safety be put upon such stays. I think I may state, that the most venturesome of the class to which my opponent evidently belongs would not subject such stays to above one-third of *their maximum tensile strength*, which would be somewhat over 21 tons. Engineers of eminence do not subject any stays to near one-third of their maximum strength; and, in an invaluable little work, lately published—I allude to Bourne's *Catechism of the Steam-Engine*, which would do eminent service to "An Engineer"—it has been stated that "iron will only bear one-third of the strain without permanent derangement of structure; and it does not appear expedient in any boiler to let the strain exceed 4000 lbs. upon the square inch of sectional area of metal; and 3000 lbs. on the square inch of section is a preferable proportion." The aggregate sectional area of metal in the stays of the exploded boiler, when perfect, only amounted to 2·2085, or under 2¼ square inches; yet we are to be told that "the staying of the boiler was perfect."

Now, Mr. Editor, I hold it to be one great point in all controversial discussions, that those engaged therein produce facts which ultimately lead—such facts being duly disseminated—to an extension of knowledge. One great inducement ought to pervade the minds of all who write: a desire to impart, as well as to receive, instruction. I am convinced there is more practical information imparted from investigating accidents than is derivable from any other source; and, where scurrility is excluded, and *facts alone* dealt with, all must, in my humble opinion, at the close of a discussion, be wiser than at its commencement. No one has deprecated more than myself the mere writing for writing's sake—*cacoethes scribendi* which exists to a great extent at the present time, of which your Journal bears ample proof. The merits of the spray pump, for instance, is an example—here has been a discussion extending over a considerable period. Nothing is easier of demonstration for Mr. Adcock—an inventor who has the capability (and those who have not, ought not to dabble in mechanics)—than showing the real power employed, and the actual results obtained. This is only done by dealing with facts—those little stubborn things which no elegance of diction can alter; if true, they are the beacons which lead inventors to ultimate success—if false, their falsity cannot be too soon rendered apparent, thereby saving many hours of unprofitable midnight toil to the poor inventor, and countless thousands to the pockets of speculative capitalists. In carrying on this discussion, I shall have ample room for the production of facts, which may benefit "An Engineer." It has been the general custom in boiler-making, where high pressures have been employed, to place stays of a comparatively small sectional area, but very close together; and in some of the fire-boxes of the locomotives lately constructed on the Great Western line, the portion of the boiler where *flat plates* are employed, there will be found ⅝ copper stays, placed only 4 in. apart throughout the entire surface; and in the domes of these boilers are 8 stays of 1⅛ inch diameter—the average number of stays in locomotive boilers used in this line being about *three hundred and sixty*, and their aggregate sectional area, amounting to over 216 square inches. The contracted for maximum strength of the *Cricket's* boilers was, I admit, only about half the pressure to which those boilers are subjected; but there is a wide difference in 216 square inches of sectional area of stays, and 2½, the *Cricket's* allotment. With regard to the action of the larboard weighted valve, it was a point with which the Government engineers, Messrs. Lloyd and Hughes, were not acquainted—they had to arrive at their conclusions from appearances that presented themselves *ten* days after the explosion. After persons had been on board, and things removed which it was not convenient to produce, no sane man would have given credence to the existence of such a mechanical absurdity; and a gentleman accustomed to view only the superior arrangements and workmanship introduced in the steam-vessels of the Royal Navy, would be the last to imagine such a glaring inconsistency could possibly exist as the one instanced by me, which I challenge "An Engineer" to disprove.

The corrosion handed me by Mr. Meecham I did not deem worthy of notice, for the following reason:—It never had been taken, as asserted, from the *Cricket's* tubes. The form of tube was retained by the corrosion, and proves that it has been obtained from one much greater in circumference than the *Cricket's*; but, admitting such to be the fact, it would only show that the generating capabilities of the boiler had been injured to a great extent—which would be the very reverse of the point endeavoured to be established. I have seen similar corrosion take place on the inside of tubes where patent fuel has been employed; and I imagine this corrosion was obtained from a leaky tube, and one where Welsh coal was not employed.

My objection to the flat valve was, such valve being located in a box not sufficiently large, the steam issuing from such valve would strike immediately against the sides of the valve-box, and on a principle known to mechanics—consequently, I should imagine, known to "An Engineer." The angle of incidence being equal to the angle of reflection, the steam would be thrown back, and a species of regurgitation generated which would render the area of the annular ring around the valve—only four-fifths its proper size in the first case—still more inefficient.

My other "erroneous" ideas, combined with the theory of the action of the gange, "not dreamt of in my philosophy," as this letter has extended already to too great a length, I must reserve for your next week's Journal.

*Park Terrace, Battersea, Dec. 23.* E. WHITLEY BAKER.

## HIGHTON'S ELECTRIC TELEGRAPH.

SIR,—In your last Number, I observe a letter, by a Mr. Chapman, of Leicester, copied from the *Builder*, in which he says—"The one-wired telegraph used at Baden-Baden, appears to be that of Brett and Little."

I do not know from what source Mr. Chapman derives his information; but, whatever it be, he has been deceived as to the point. Your statement, some weeks since, that the Baden Government had adopted Highton's gold leaf telegraph was quite correct; and I am sure you will agree with me, that, before Mr. Chapman contradicted it, he ought to have taken more pains to ascertain the correctness of this information.

*Euston-station, Dec. 21.* EDWARD HIGHTON.

## ADCOCK'S SPRAY PUMP.

SIR,—Your correspondent, "C. E.," in his communications of the 13th Nov., and 18th December, displays infinitely more zeal than discretion: he writes without argument, and declaims without making one reasonable remark. His letters, throughout, display a strange absence of grammar, sound logic, and even an elementary knowledge of science; and, while he professes the most profound contempt for "book-learned" philosophers, he very unceremoniously mimics the character, by a most flagrant plagiarism; for the table which he vulgarly styles, "Of the force of winds," is from the elaborate *Statistics of Locomotion, compared with the Velocity of the Wind*, the latter calculated by Professor Ferguson, F.R.S.; in adopting which, as his own, "C. E." has incorrectly altered a few terminal figures, and given a few different, but synonymous words, in the explanations, to cover this petty larceny. It is not often that such an over-zealous, unlettered, friend as "C. E." is to be found volunteering as a champion in the cause of one who is "a perfect stranger;" but since he is so particular in assuring us "his entire ignorance of Mr. Adcock, I may be permitted to acquaint him, that that gentleman is pretty well known as the author of *Rules and Data for the Steam-Engine, both Stationary and Locomotive*; and for *Railways, Canals, and Turnpike-roads, being a Synopsis of Eight Lectures on Mechanical Philosophy, illustrative of the most recent modes of construction*; and *An Exposition of the Errors of which Patentees and others are liable, from their not being acquainted with the Practical Departments of Engineering.*

In his first letter, "C. E." denounces the criticisms of the spray pump, in your Journal, as "a disgrace to the nation and the age," but omits adducing a single proof to establish this monstrous assertion. For my own part, I consider that any impartial reader of your much esteemed paper will agree with me that, apart from some little occasional warmth of discussion, the principles and practice of the spray pump have been so ably, fairly, and fully stated, that even the patentee himself, as a scientific lecturer and writer, has, so far from disproving those statements, always shrunk from giving answers to every plain, simple, inquiry of a practical bearing. In the same letter, "C. E." elegantly and scientifically states, that "the spray pump, in its *present state of perfection*, is not well adapted for sinking operations;" and again, "it is liable to be deranged, in *blasting* the hard ground with *gunpowder*." Another of his beauties of style and sense flashes on us, where, in his last letter, he says, "I can tell Mr. Williams this, that had Mr. Adcock as many friends to support him in testing his pump, as he has *ignorant prejudices* to contend with against its merits, the spray pump would long since have been before the public." Has he actually seen no reports of the public exhibitions of the pump at Llanhiddel and other places, before mine owners, ironmasters, engineers, and gentlemen of rank and fortune interested in mining operations? Does he charge all these with possessing only "ignorant prejudices?" Such language is wild and reckless in the extreme.

Equally foolish is his declaration, that—"no sooner does an inventor make known his discovery, than he is assailed by the book-learned would-be philosophers;" and further on he says—"the merits of the spray pump have not had a *fair trial!*" What fustian such assertions must appear to all who know (except, perhaps, "C. E.") that the spray pump has cost capitalists many thousands of pounds during the trials made with it, for the last six years, and continues to the present day to be advertised as "perfected and successful" at Llanhiddel.—P.S.—While on the subject, I may mention, that the dates of Mr. Adcock's patents (suppressed in his pamphlet on the *Spray Pump*), are 9th December, 1836, and 22d May, 1838, so that the first expires in 1850, and the last in 1852, very little above four years hence.—M. H.

Mr. Young, a chemist, of Manchester, has discovered that a waste product from the manufacture of chlorine, consisting chiefly of a solution of chloride of manganese, destroys the odour of night soil and other decomposing matters without impairing their fertility. The liquid is produced in very large quantities, and has hitherto been thrown away.

FIRST EXPLORATION OF A CAVERN.—In the limestone strata, which composed the bases of the mountains at Ingleborough and Penaighent, in the West Riding of Yorkshire, there are a number of chasms, called pots, in the dialect of the district, most of them of an unknown depth, and generally the receptacle of some mountain stream. They are commonly so formed about their openings on the surface of the ground as to preclude the possibility of looking down them, or making a descent even with ropes or ladders. The descent into one of the largest of these gulfs has, however, lately been effected through a large, and, as far as is known, hitherto unexplored cavern, by a party of the neighbouring gentry, consisting of Messrs. J. Birkbeck, W. Howson, and W. and T. Carr. The entrance into the cave is situated about 200 yards above Allan Pot, as the chasm is called, towards which it proceeds in a tortuous course, by gradual and occasional abrupt descents, through vast chambers, till it terminates at the edge of the precipice, from which may be descried, far above, the mouth of the pot, and 50 ft. below the apparent bottom. This precipice has been descended with tolerable ease by means of ladders taken through the cave, and with ropes. On proceeding forward, under wide arches of overhanging rocks, and a further descent of 40 ft., the lowest accessible bottom is reached, and the river presents itself to the eye of the spectator. The height of the waterfall thus seen is 120 ft., and it falls on, in the same perpendicular torrent, down another chasm, a depth of 150 ft.

## THAMES TUNNEL COMPANY.

The number of passengers who passed through the Tunnel in the week ending Dec. 18, was 16,998; amount of money, £70 16s. 6d.

ASSAYING AND ANALYSIS.—Mr. MITCHELL begs to inform the MANAGERS, &c., of MINES, SMELTING-WORKS, and MANUFACTORIES, that he still continues to CONDUCT ASSAYS and ANALYSES of all PRODUCTS, metallurgical and manufacturing, at his LABORATORY,
23, *HAWLEY-ROAD, KENTISH TOWN, LONDON,*
to which address communications are to be forwarded.—Instruction in all branches of assaying and analysis as usual.

PATENT GALVANISED IRON AND WIRE ROPE WORKS,
*MILLWALL, POPLAR.*
ANDREW SMITH begs to inform the Mining, Railway, and Shipping interests, that he has obtained a PATENT for an IMPROVED METHOD of GALVANISING IRON, producing a much superior article at a considerable saving in cost—the improved process for galvanising wire rope, adding only £10 per ton instead of £20, under the ordinary processes. The rope is extensively used in damp situations, for mining and railway purposes, and for ships' standing rigging.

THE PATENT SAFETY FUSE,
FOR BLASTING ROCKS IN MINES, QUARRIES, AND FOR SUBMARINE OPERATIONS.—This article affords the SAFEST, CHEAPEST, and most EXPEDITIOUS MODE of effecting this very hazardous operation. From many testimonies to its usefulness with which the manufacturers have been favoured from every part of the kingdom, they select the following letter, recently received from John Taylor, Esq., F.R.S., &c.:—"I am very glad to hear that my recommendations have been of any service to you; they have been given from a thorough conviction of the great usefulness of the Safety Fuse; and I am quite willing that you should employ my name as evidence of this."
Manufactured and sold by the Patentees, BICKFORD, SMITH, and DAVEY, Camborne, Cornwall.

## MEETINGS OF PUBLIC COMPANIES DURING THE WEEK.

MONDAY.....Killarney and Valentia Railway—George and Vulture Tavern, at One.
National Mercantile Life Assurance Company—offices, at Twelve.
TUESDAY.....Birmingham and Oxford Railway—Dee's Royal Hotel, Birmingham, at half-past Two.
Barbadoes Railway Company—London Tavern, at Twelve.
WEDNESDAY..Ballenwidden Mining Company—at the mine.
Wheal Trevenna Mining Company—Fountain Inn, Liskeard, at Two.
Derbyshire, Staffordshire, & Worcester Junction Railway—offices, Twelve.
Southampton Dock Company—offices, at One.
Swansea Valley Railway—offices, half-past Two.
Rock Life Assurance Company—London Tavern, at Twelve.
THURSDAY. ....Wheal Fortescue Mining Company—offices, Tavistock, at Three.
Pacific Steam Navigation Company—offices, Liverpool, Twelve for One.

[*The meetings of Mining Companies are inserted among the Mining Intelligence.*]

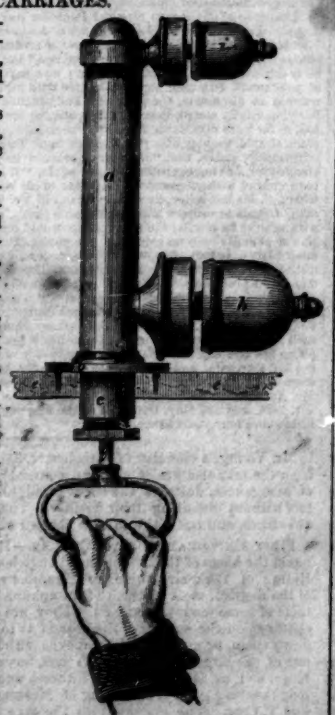
## IMPROVEMENTS IN THE MANUFACTURE OF IRON.

[Specification of patent granted to William Vickers, of Sheffield, for improvements in the manufacture of iron.—Patent dated June 19, 1847.]

This invention relates to the manufacture of wrought-iron, and consists in melting pig-iron with wrought-iron, and running the melted mixture (when divided into streams) into water; and then, by the ordinary process of manufacture, in converting the product into malleable, or wrought-iron. In order to explain his invention as completely as possible, the patentee describes the means by which the same may be carried into practical effect, by a statement, which is, in effect, as follows:—He causes pig-iron to be melted with scrap of wrought-iron, or turnings, in any suitable furnace, and states, that he has used for that purpose a cupola furnace; and, also, that the proportions of such mixture of wrought-iron with pig-iron may vary greatly, but that a very small addition of wrought-iron to pig-iron, run into water, will be found to produce a great improvement in the quality of iron manufactured therefrom. Sometimes he employs the following proportions:—To 30 parts of wrought-iron he adds 70 parts of pig-iron, by weight; and, although this may not be found to answer for some purposes, still, for ordinary purposes, it has been found to answer well. If, however, the iron should be intended to be made into steel, it will be necessary to increase the proportion of wrought-iron, by mixing with the pig-iron about 40 per cent. of wrought-iron. He further states, that in the manufacture of iron intended for general purposes, he has used, with advantage, a mixture of 30 per cent. of scrap of wrought-iron, or turnings, with pig-iron; and such mixture, when melted, may be divided into small streams, and run into water, in any convenient manner. For this purpose, the patentee states he has used the following arrangement:—He takes a cast-iron tray, perforated with holes of half-an-inch in diameter, and this he lines, about half-an-inch thick, with a sand, or composition, such as is used for stopping cupola furnaces with; and he punctures this composition with holes about a quarter of an inch in diameter—such punctures being immediately over the holes in the tray, and then places such tray about 15 ft. above the level of the water in the tank (employed for solidifying the iron), which is of wood, and about 4 ft. deep; and the melted metal passing from the furnace, through the perforated tray, into the water in the said tank, will be found therein in a divided state. This product he uses in the manufacture of wrought-iron, and treats it as in the manufacture of wrought-iron from pig, or refined iron. The patentee adds, that he has used, with advantage, in the melting of pig-iron with wrought-iron, from 3 to 5 per cent. of black oxide of manganese, which he believes will be found to be advantageous. This may be added from time to time, by placing small pieces in the tuyere holes—the blast dividing it into the furnace as the mixture becomes melted. Having described the nature of his invention, and the manner in which it may be performed, the patentee states, that he does not claim the melting of wrought-iron with pig, or cast-iron, nor the running of melted cast-iron into water, when separately considered; neither does he claim the precise mode set forth, so long as the peculiar character of his invention be retained; but what he claims, is melting pig-iron with wrought-iron scrap, or turnings, and then running it into water, and using the product in the manufacture of wrought, or malleable iron.

*Patent-office and Designs Registry*, 210, *Strand, Dec.* 21, 1847.

## DOUBLE-ACTING ALARUM WHISTLE FOR RAILWAY CARRIAGES.



We have pleasure in introducing to our readers the following ingenious invention, which has just been registered by Mr. Jonathan Hunt, of Kennington-oval:—The apparatus consists of a small cylinder, *a*, which is firmly attached to the roof of the carriage by its flange, *b*; the lower portion, *c*, projecting through the roof of the carriage, the cylinder, *a*, is bored out perfectly cylindrical, and fitted with a hemp-packed piston, from which extending downwards is a piston-rod, *g*, working through a stuffing-box, which piston-rod is furnished with a handle, *d*. On the upper part of the vertical cylinder is fixed a small whistle, *i*, of the form generally used in locomotives, which lies in a horizontal position at the lower portion of the cylinder; another whistle, *h*, similar in form and position, but much larger than the upper one. In case of accident, the passengers within the carriage have only to take the handle, *d*, and draw it downwards, the air in the cylinder below the piston will be immediately compressed, and in this state will issue from the whistle, *h*, with a shrill sound; on the action being reversed, the air which has obtained access to the upper side of the piston is compressed, and forced out of the whistle, *i*, which it will be observed is much smaller—this is for two reasons: the sizes of the whistle being dissimilar, the sounds emitted therefrom will vary also; the other reason is that the action of raising the handle is not so convenient, being effected, in the upward stroke.

The object of the inventor is, we believe, by their economical manufacture, to induce railway companies to have a good stock of his whistles, and to enforce their use in all carriages travelling on their lines—the recent accident to the Countess of Zetland and her servant too well proves how essential it is to have recourse to some means of communication between passengers and the officials; while we have no hesitation in saying, from personal inspection, that the plan of Mr. Hunt is not only ingenious, but well calculated to effect the desired object.

TIN VALE MINING COMPANY, ST. NEOT, 47
COUNTY CORNWALL.
1000 parts, or shares, of £3 per part, or share.
*NOW AT WORK ON THE "COST-BOOK" PRINCIPLE.*
CHAIRMAN.
ROBERT OWEN ALAND, Esq., Cambridge-terrace, Hyde-park.
DIRECTORS.
JOHN POSFORD OSBORNE, Esq., Ardleigh Park, Colchester.
JOSEPH CARRINGTON RIDGWAY, Esq., Roehampton Lodge, Roehampton.
BENJAMIN FORRESTER SCOTT, Esq., Northampton Park, Ball's Pond.
BARTHOLOMEW DAWES, Esq., Soho-square.
JOHN THOMAS ROSE, Waterloo, Northampton.
WILLIAM W. MANSELL, Esq., *Purser*, Dorchester-place, Blandford-square.
*Captain of the Mine*—Mr. John Floyd, Harrowbridge.
*Solicitor*—John Butler, Esq., 134, Tooley-street, Southwark.
*Bankers*—Messrs. Ransom and Co., London.
PROSPECTUS.
This mine is situate at Harrowbridge, in the parish of St. Neot, in the county of Cornwall, on the banks of the Drains River, and extends over about 200 acres of mineral land. It is held on lease for 21 years, from the lords of the manor, at a royalty, or due, of 1-15th, totally free from sleeping or dead rent.
Five tin lodes underlaying south, have already been opened. A shaft has been sunk about 10 fathoms in the cross-course, and two adits driven—one about 80 and another 20 fathoms. The first lode in the cross-course, and two adits driven—one about 80 and another 20 fathoms. The first adit, marked A on the map, has already been opened 10 fathoms to the east, and about 50 fathoms to the west, on the course of the lode, from which ore is procured, and a considerable quantity is now on the bank, ready for stamping.
The second adit, marked B on the map, has been driven 20 fathoms on the course of a lode, of most promising appearance.
Five pairs of stamps are in course of construction, as well as all necessary machinery for carrying on the works efficiently; and Captain Floyd asserts that returns will be made before Christmas.
The ore is of the best description, being free from compound.
The tin streams are considerable: they have been secured also for the company, at a royalty, or due, of 1-
The freehold of land, and arrangements have been made for working them on tribute.
obtained, and the quantity sufficient for the erection of workmen's cottages, has likewise been
The operations of the of granite which abounds in the locality renders building cheap.
exempts the company mpany are carried on under the "Cost-book" Principle, which
Companies (7 and 8 Vic the provisions of the Act for the Registration of Joint-Stock
p. 110), the 63d section of which enacts—
"Provided always d be it enacted, that nothing in this Act contained shall extend, or be construed extend, to any partnership formed for the working of mines, minerals, and quarries what nature soever, on the principle commonly called the Cost-book Principle."
Under the "Cost-book" ciple, shareholders have the right of determining their responsibility, by giving notice their intention to relinquish their shares, and on forfeiture of all previous payments.
The 15th clause states—
"That any adventurer shareholder, may determine his or her responsibility or liability to the affairs of the mine, upon his or her giving notice, in writing, to the purser of the company for the time being, of his or her desire of retiring from the company; and, also, upon depositing with the said purser the share or shares held by him or her, and signing a relinquishment of all claims or demands on the company in respect to such share or shares."
The directors, after considerable negociation, have succeeded in effecting the following arrangement, which they consider fully advantageous to the company—namely: That the present lessees, in consideration of the transfer of the lease to the company, for the machinery in course of erection, and the works hitherto effected, to be paid the sum of £1000 cash, and to have one-tenth of all profits arising from the mine, until a further sum of £1500 shall have been paid thereon; the company having the option of cancelling the latter disbursement on payment of the sum of £1000 on or before the 29th of September, 1848.
Applications for shares to be made to the purser, W. W. Mansell, Esq., at the temporary offices of the company, 17, Dorchester-place, Blandford-square; John Butler, Esq., solicitor to the company, 134, Tooley-street, Southwark; James Lane, Esq., mining shareholder, 75, Old Broad-street, city; and Messrs. Oliver and Co., stock and share brokers, Coggeshall, Essex—where prospectuses and every information may be obtained; also at the office of the *Mining Journal*.

TO ENGINEERS AND BOILER-MAKERS.
LAP-WELDED IRON TUBES, FOR MARINE AND LOCOMOTIVE STEAM-BOILERS,
TUBES FOR STEAM, GAS, AND OTHER PURPOSES,
*ALL SORTS OF GAS FITTINGS.*
THE BIRMINGHAM PATENT IRON TUBE COMPANY, 48
42, CAMBRIDGE-STREET, BIRMINGHAM, & SMETHWICK, STAFFORDSHIRE,
MANUFACTURE BOILER and GAS TUBES, under an exclusive License from Mr. R. Prosser, the patentee. These tubes are very extensively used in the boilers of marine and locomotive steam-engines in England and on the Continent—are stronger, lighter, cheaper, and more durable than brass or copper tubes, and warranted not to open in the weld.
42, CAMBRIDGE-STREET, CRESCENT, BIRMINGHAM.
*WORKS—SMETHWICK, STAFFORDSHIRE.*
LONDON WAREHOUSE—No. 68, UPPER THAMES-STREET.

IMPORTANT TO RAILWAY AND STEAM NAVIGATION COMPANIES, MANUFACTURERS, & ENGINEERS. 49
W. BROTHERTON AND CO.'S
PATENT LUBRICATING FLUID (or Animal Oil) FOR ALL DESCRIPTIONS OF MACHINERY.
W. B. & CO. have the pleasure to state, that the above article is extensively used in her Majesty's Steam Navy, and by several of the principal Steam Navigation and Railway Companies, and is pronounced by them, and by the first practical engineers of the day, to be far better adapted for the purposes of lubrication than any other article hitherto used for such purposes. The Patent Lubricating Fluid is equally applicable for the most intricate and fine pieces of machinery, as for the heaviest bearings of the steam-engine. It is cheaper, much more economical, and cleaner than oils at present in use; is free from smell, and calculated to effect a vast saving in the expenditure of working steam powers.
Further particulars can be had, and testimonials seen, by application to the manufacturers, W. BROTHERTON & CO., Hungerford Wharf, Strand, London.
N.B.—The above article will burn in lamps, and give a light equal to the best sperm oil.

PATENT IMPROVEMENTS IN CHRONOMETERS, WATCHES, AND CLOCKS.—E. J. DENT, 82, Strand, and 34, Cockspur-street, watch and clock maker, BY APPOINTMENT, to the Queen and His Royal Highness Prince Albert, begs to acquaint the public, that the manufacture of his chronometers, watches, and clocks, is secured by three separate patents, respectively granted in 1836, 1840, 1842. Silver lever watches, jewelled in four holes, 6 gs. each; in gold cases, from £8 to £10 extra. Gold horizontal watches, with gold dials, from 8 gs. to 12 gs. each. 50
DENT'S PATENT DIPLIEDOSCOPE, or meridian instrument, is now ready for delivery. Pamphlets containing a description and directions for its use 1s. each, but to customers gratis.

THE PATENT OFFICE AND DESIGNS REGISTRY,
*No.* 210, *STRAND, LONDON.*
INVENTORS will receive (gratis), on application, the OFFICIAL CIRCULAR OF INFORMATION, detailing the eligible course for PROTECTION of INVENTIONS and DESIGNS, with Reduced Scale of Fees.
Messrs. F. W. CAMPIN and CO. offer their services, and the benefit of many years' experience, in SECURING PATENTS and REGISTRATIONS OF DESIGNS, with due regard to VALIDITY, economy, and dispatch—assisted by scientific men of repute.
Also, in MECHANICAL and ENGINEERING DRAWINGS, whether connected with Patents, Railways, or otherwise, by a staff of first-rate draftsmen.
Application personally, or by letter, to F. W. Campin and Co., No. 210, Strand (corner of Essex-street).

OFFICE FOR PATENTS, 7, STAPLE INN, HOLBORN.
J. MURDOCH (successor and late assistant to Mr. Hebert)
Informs INVENTORS and PATENTEES, that, at his OFFICE, they can obtain
REFERENCE TO A CLASSIFIED LIST OF PATENTS, 52
(THE ONLY ONE EXTANT), which shows at one view all the Patents ever granted for any particular object, whereby they may save much trouble and expense, and procure information not otherwise obtainable. BRITISH and FOREIGN PATENTS OBTAINED, and USEFUL and ORNAMENTAL DESIGNS REGISTERED.
SPECIFICATIONS carefully prepared, and REPORTS of ENROLLED SPECIFICATIONS furnished on moderate terms.
FINISHED and WORKING DRAWINGS executed with accuracy and dispatch.

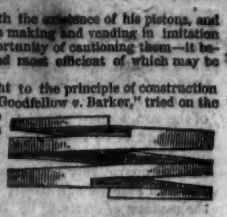
CLERICAL, MEDICAL, AND GENERAL LIFE ASSURANCE SOCIETY.
Persons of all ages, and in every station, may assure with this society on very moderate terms. No extra premium is required for sea-risk, or residence in any part of Europe. Persons wishing to visit, or reside in, other parts of the world, may also effect policies at a small increase of premium. BONUSES.
The two first divisions averaged £22 per cent. on the premiums paid; the third, 38*l.* per cent. The FOURTH bonus, declared January, 1847, averaged rather more than £36 per cent.; and from the large amount of profit reserved for future appropriation and other causes, the bonuses hereafter are expected to exceed that amount.
Tables of rates, with the last full report, can be obtained of the society's agents, 53 or by addressing a letter to GEO. H. PINCKARD, Resident Secretary.
No. 99, Great Russell-street, Bloomsbury, London.

NATIONAL LOAN FUND LIFE ASSURANCE SOCIETY,
26, *CORNHILL, LONDON.*
Capital £500,000.—Empowered by Act of Parliament. 54
This institution embraces important and substantial advantages with respect to Life Assurances and Deferred Annuities. The assured has, on all occasions, the power to borrow, without expense or forfeiture of the policy, two-thirds of the premiums paid (see table); also the option of selecting benefits, and the conversion of his interests to meet other conveniences or necessity.
Assurances for terms of years are granted on the lowest possible rates.
DIVISION OF PROFITS.
The remarkable success and increasing prosperity of the society has enabled the directors, at the first annual investigation, to declare a fourth bonus, varying from 35 to 85 per cent. on the premiums paid on each policy effected on the profit scale.
EXAMPLES.

| Age | Sum. | Prem. | Year. | Bonus added. | Bonus in Cash. | Permanent reduction of Premium. | Assured may Borrow. |
|---|---|---|---|---|---|---|---|
| 60 | £1000 | £0 3 4 | 1837 | £317 15 1 | £109 0 11 | £16 0 4 | £445 0 0 |
| | | | 1838 | 192 3 0 | 87 1 4 | 13 10 2 | 295 11 1 |
| | | | 1839 | 165 11 10 | 74 1 9 | 11 3 1 | 346 2 3 |
| | | | 1840 | 116 7 6 | 54 0 10 | 7 18 10 | 296 13 4 |
| | | | 1841 | 111 6 8 | 49 10 0 | 7 10 4 | 247 4 5 |

The division of profits is annual, and the next will be made in December of the present year.
F. FERGUSON CAMROUX, Secretary.

TO ENGINEERS, RAILWAY, AND STEAM-BOAT COMPANIES, AND THE PROPRIETORS OF STEAM-ENGINES GENERALLY.
BENJAMIN GOODFELLOW,
THE PATENTEE OF THE COMPOUND ACTING AND SELF-ADJUSTING METALLIC PISTONS, 55
Desires to solicit the attention of the above parties to the said improvement; the peculiar advantages of which are, that they are particularly sensitive to any variation in the size of the cylinder, and will accommodate themselves to an oval, with a constant tendency to wear it cylindrical. The junk-ring, or cover, is brought down upon the bed of the piston securely and truly, leaving the packing perfectly at liberty between the plates—against which the spring presses the outside rings or casing, as well as to the surface of the cylinder, thereby preventing the escape of steam either past or into the piston—at the same time the friction being the least possible.
As there are many, no doubt, still unacquainted with the existence of his pistons, and the same being liable to be imposed upon by parties making and vending in imitation (but with slight variation in form), he takes this opportunity of cautioning them—it being susceptible of many modifications, the simplest and most efficient of which may be seen is the subject of his patent.
The patentee has twice established his exclusive right to the principle of construction of his improved metallic pistons—once in an action "Goodfellow *v.* Barker," tried on the 11th February, 1846, in the Court of Exchequer, before the Chief Baron and a special jury, when a verdict was found for the plaintiff. In this case the defendant's infringement was a helical or spiral formed spring—thus: around which was placed a metallic casing, to which it gave a compound, or vertical, and lateral pressure, an arrangement which was proved, in both trials, never to have existed before the plaintiff's patent.

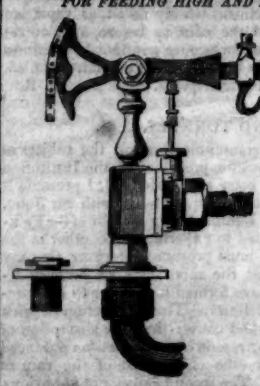


A similar result attended a former action, "Goodfellow *v.* Swindlehurst," tried at the assizes at Liverpool, in March, 1845; the infringement of which was a series of wedge-form segments, acted upon by a flat-spring, thereby producing the compound action.
And, as a proof of the clearness of his established right to the said improvements, the juries in both cases, after long and well contested trials, were not three minutes in finding verdicts for the plaintiff.
B. G. begs to say, that he is prepared to manufacture any size of metallic pistons, or buckets, on the shortest notice; and has, at present, all sizes at work, up to 85 inches diameter, and air-pump buckets up to 48—specimens of which may be seen, and any particulars had, at his works, Hyde, near Manchester. He can rebore the cylinders for the same (when required), without removing them from their places, and will guarantee that all shall be of the best material and workmanship, and engages to give every satisfaction to parties who may favour him with their orders.
There are now upwards of *one thousand four hundred* of them at work, and principally at very large and respectable firms—a list of which may be had on application, as above.

IMPROVED LIFTING JACKS, 56
MANUFACTURED BY
W. AND J. GALLOWAY,
PATENT RIVET WORKS,
*MANCHESTER.*
IMPROVED RATCHET JACK. HALEY'S PATENT LIFTING JACK.

*.* The attention of parties who employ
**Lifting Jacks,**
is respectfully requested to the superiority of those annexed, over those hitherto in use.

FROST, NOAKES, & VINCENT'S HIGHLY-IMPROVED SELF-ACTING HYDROSTATIC BALANCE,
*FOR FEEDING HIGH AND LOW-PRESSURE STEAM-BOILERS.*



This highly-important and simple invention, the proprietors strongly recommend to those parties connected with steam boilers, as it prevents any possibility of explosion through want of water, by its always maintaining the water at a proper level; and it is not easily deranged, and requires little or no attention.
STEAM-COCKS screwed to suit the patent wrought-iron tubing, from ¼ inch to 2 inches.
Double flange cocks, of all sizes, safety valves, water indicators, steam-gauges, whistles, &c. 57
BRASS-WORK, of all descriptions, for steam and other purposes.
FROST, NOAKES, AND VINCENT,
(ORIGINALLY JAMES FROST),
*Established* 1818,
BRASS-FOUNDERS & PATENT COCKS MANUFACTURERS,
No. 195, BRICK-LANE, WHITECHAPEL, LONDON.
*N.B.—WORK MADE TO DRAWINGS.*

J. STUBBS' IMPROVED LUBRICATOR.
*Registered, Nov.* 29, 1847.—MANUFACTURED BY
FROST, NOAKES, AND VINCENT, 58
195, *BRICK-LANE, WHITECHAPEL, LONDON.*
The ADVANTAGE this MACHINE presents over any other now in use for OILING MACHINERY, is, that the OIL can be DISCHARGED in ANY QUANTITY, as required—viz., from 1 drop in five minutes to 20 a minute; and is well adapted for connecting-rods, excentrics, &c., as the oil cannot be spilt by any sudden jerk, or the action disarranged.
COPY OF SPECIFICATION:—

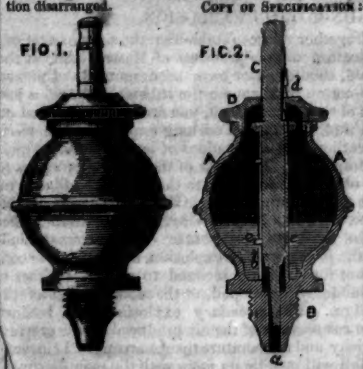
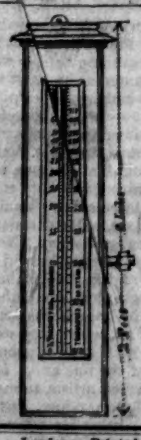


Fig. 1, is an external elevation, and fig. 2, a sectional elevation of this instrument. A, A, is an outer case, which contains the oil to be used for lubrication. B, is a screwed neck, by which it is fixed to the pedestal, or brass, of the bearing upon which it is applied. C, is a graduated spindle—the lower end of which forms a valve, which, as it is lifted further up from its seat, allows a proportionately greater quantity of oil to escape from the aperture, *a*, into which the oil is admitted through a narrow slot, *b*, which is cut in the side of the tube, *c*, of the valve spindle. The graduations upon the spindle, *c*, indicates the length the valve is lifted, and, consequently, the quantity of oil allowed to pass; *d*, is a spring, which keeps the valve at any height it may be set to; and, *e*, is a small pin, projecting from the side of the spindle, which keeps the slot, *b*, always clear of any thing which would obstruct the passage of the oil. D, is a cover to the case, A, which prevents the spilling of the oil by any sudden jerk.—These arrangements admit of the oil being supplied to the journal in drops, at greater or lesser intervals of time, according to the size and requirements of the parts to be oiled.



HENRY BAKER begs to call the attention of Engineers and Proprietors of Steam-Engines, to his NEWLY-IMPROVED STEAM-GAUGE,
which shows the PRESSURE and TEMPERATURE of the STEAM, as seen in the drawing annexed. It is an ornament to the engine-room, and supersedes the ordinary mercurial gauge in these respects, by not being so cumbersome—much cheaper, and warranted accurate.
Boiler explosions, in many instances, occur through steam-gauges not being in good working order; therefore, every attention should be paid to these very necessary adjuncts.
HENRY BAKER'S STEAM-GAUGES 59
may be FIXED in a COUNTING-HOUSE, and will SHOW the PRESSURE the same as if fixed in an engine-room—thereby having a check on the person working the engine.
*Price*.....£2 2s.
VACUUM-GAUGES, in brass frames, showing the barometric scale, from 22 inches to 30 inches.—Price, £3 3s.
Ditto ditto, in mahogany, very elegant, showing the barometric scale in full.—Price, £3 3s.
HENRY BAKER,
BAROMETER, THERMOMETER, & STEAM INSTRUMENT MANUFACTURER,
90, *HATTON-GARDEN, LONDON.*

London:—Printed and Published, weekly, by HENRY ENGLISH, at the Office, No. 26, FLEET-STREET, in the city of London, where all Communications and Advertisements are requested to be forwarded—addressed to "the Editor"—post-paid. *December* 25, 1847.
*.* It will at all times save much delay and inconvenience, if communications are directed simply
To THE EDITOR,
*Mining Journal Office,*
26, FLEET-STREET, LONDON.
And POST-OFFICE ORDERS, &c., must be made payable to WILLIAM SALMON MANSELL, as acting for the proprietors.